SATO

DCS & Labeling Worldwide

S8400

OPERATOR'S MANUAL

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Be sure to ask your dealer about our maintenance contracts
to ensure peace of mind during your usage of SATO products

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SATO International

Warning: This equipment complies with the requirements in Part 15 of FCC rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference.

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1

OVERVIEW

Thank you for your investment in this SATO printer product.

This Operator's Manual contains basic information about the installation, setup, configuration, operation and maintenance of the printer.

A total of seven topics are covered herein, and they are organized as follows:

Section 1: Overview
Section 2: Installation
Section 3: Configuration and Operation
Section 4: Cleaning and Maintenance
Section 5: Interface Specifications
Section 6: Troubleshooting
Section 7: Optional Accessories

It is recommended that you become familiar with each section before installing and maintaining the printer. Refer to the **Table Of Contents** at the front of this manual to search for the relevant information needed. All page numbers in this manual consist of a section number followed by the page number within the stated section.

For specialized programming, refer to the separate Programming Manual located on the utility CD-ROM.

1.1 GENERAL SPECIFICATIONS

The SATO S8400 series OEM print engine (Thermal Transfer and Direct Thermal) is a complete, high-performance labeling system designed for integration into in-line production facilities.

The key features of the S8400 series are:

- High-end, high resolution print engine with industry-leading functionality
- Large 128 dot by 64 dot LCD panel with graphical icon display
- Super crisp printing at resolutions of 203 dpi, 305 dpi or 609 dpi
- Tool-less changing of print heads for easier maintenance
- Optional cassette tray ribbon loading for reduced turnaround time
- Support for a wide range of legacy as well as modern I/O interfaces
- Enhanced print position accuracy even in high volume print jobs
- Support for SATO Barcode Programming Language for enhanced customizability
- Support for SEMBL programming for standalone operation customizability
- Supports for Radio Frequency IDentification technology for enhanced productivity
- Built-in calendar function for time and date data labeling
- Lightweight and easy-to-mount chassis
- All three models are available in Left-hand and Right-hand orientations
- User friendly label and ribbon path management
- Support for a wide range of accessories and peripherals for custom-applications

All printer parameters are programmable using the front panel controls and via software. All popular bar codes, including 2-D codes, seven human-readable fonts and two fast and efficient vector fonts, are resident in memory, providing literally thousands of combinations of type styles and sizes.

1.1 GENERAL SPECIFICATIONS

Specification	Model S8408	Model S8412	Model S8424
Electrical Characteristics			
Print method	Thermal transfer and direct thermal		
Head density	8 dots/ mm (203 dpi)	12 dots/ mm (305 dpi)	24 dots/ mm (609 dpi)
Printable Area	W104 mm x pitch 2500 mm	W104 mm x pitch 1500 mm	W104 mm x pitch 400 mm
	Not printable for 3 mm from the inner edge		
Print speed (Max)	4 to 16 inches/sec @203dpi	4 to 14 inches/sec @305dpi	2 to 6 inches/sec @609dpi
	Note: Maximum speed may be further dependent on the type of print layout, paper, or carbon ribbon in use.		
CPU	32-bit RISC		
Onboard Memory	4 MB FLASH ROM, 16 MB SDRAM main memory (2.95 MB allocated for Receive Buffer), 32 KB FRAM, 8 KB SRAM for built-in calendar		
Memory cartridge	Built-in CF card reader for optional factory-installed CF card		
Print Characteristics			
Print/Dispensing Modes	Continuous, Dispenser, Linerless (when selecting linerless media)		
Print Formats	Transmitted from host (computer)		
Paper Thickness	0.05 mm to 0.31 mm supported **Note:** Be sure to use only printer supplies manufactured or certified by SATO.		
Paper Size ***in continuous mode**	Width: 22 mm to 128 mm (25 mm to 131 mm including liner) Pitch: 6 mm to 356 mm (9 mm to 359 mm including liner)		
Paper Supply Method	Via external unwinder		
Pitch (paper) Sensor	Reflective type (I-mark) and Transmissive type (Gap) Optional I-mark sensor for detecting I-marks located on the top (printable) side of labels		
Carbon ribbon **Dimensions** **Thickness of base material** **Color** **Winding direction**	(Be sure to use the specified carbon ribbons manufactured or specified by SATO) W25mm to 128m by up to 1000 m/roll (max outer diameter should be within 108 mm) 4.5 µm Black (standard) with other colors available as optional consumables Face-In and Face-out winding (see table below)		

Labels and Ribbons available for the S8400 series		
Ribbons		
Type	**Wax**	T102C, T101A, T104C
	Wax/Resin	T110A, T112D, T123A, T122B, T123B
	Resin	T222A, R335A, R236A, R333A
Labels		
Type (0.05 mm to 0.31 mm)	**Paper**	Fasson: Vellum extra, MC Primecoat, Premium TT1C Raflatac: TOP E, ECO, Mactac KL370 (thermal), Raflagloss
	Film	Fasson: 2mil Gloss White, PE transparent Raflatac: PE Gloss White

1.1 GENERAL SPECIFICATIONS (CONT'D)

Specification/ Model Name		S8400
Interface Characteristics		
External connectivity (Slot 1)		Interface boards available: ¤ Parallel (IEEE1284) ¤ RS-232C • READY/BUSY • XON/XOFF • Status 2/3 • Driver specific protocol • Status 5 ¤ USB (Ver. 1.1) ¤ LAN (10BASE-T/ 100BASE-TX automatic changeover) ¤ Wireless LAN (IEEE802.11b) ¤ Centronics ¤ RS-422/485
External connectivity (Slot 3)		Standard 14-pin Amphenol External (EXT) signal interface Optional D-Sub 25-pin External (EXT) signal interface
Configuration and Functions		
User settings (via LCD)		1. Settings indications 2. Print speed 3. Print darkness 4. Print position adjustments 5. Zero slash changeover 6. Proportional pitch adjustments
Operation Panel	**Buttons**	LINE, FEED, ENTER, CANCEL, FUNCTION, 4 navigation buttons (up/down/ left/right)
	Switch	POWER ON/OFF
	LCD	Green LCD (with backlight), Vertical 64 dots x horizontal 128 dots
	LEDs	POWER (Green), ONLINE (Green), LABEL (Red), RIBBON (Red) indicators
	Adjustment Potentiometers	VOLUME: buzzer loudness adjustment PITCH: print position adjustment OFFSET: dispense adjustment DARKNESS: print darkness adjustment
	Other Functions	Status Monitor Commands for drawing of graphics Sequential numbering Form overlay support Storage of Customized Font Characters in memory Reverse printing function (White text on a black background) Function for printing of lines and boxes Label format storage function Zero-slash character switching, HEX Dump Print function, Calendar function.
DIP Switches		One 8-bit DIP switch
Programming Language		SATO Barcode Printer Language Ver 4.2
Automatic diagnostics		Head check (for detection of failed heating elements in the print head) Head resolution diagnostic "Paper-End" detection "Cover Open" detection Test Print Ribbon End detection Ribbon Near End detection Calendar Check

1.1 GENERAL SPECIFICATIONS (CONT'D)

Specification/ Model Name		S8400		
Barcoding Functions				
Barcodes Supported	**One-dimensional code**	• UPC-A/E, EAN8/13 • NW-7 • INTERLEAVED 2 of 5 (ITF) • INDUSTRIAL 2 of 5 • MATRICES 2 of 5 • CODE39, CODE93, CODE128 • UCC/EAN128 • RSS-14 • MSI • POSTNET • BOOKLAND • Customer barcode		
	Two-dimensional code	• QR code model 2, Micro QR (Ver 8.1) • PDF417 (Ver. 2.4, including micro PDF) • MAXI code (Ver. 3.0) • Data matrices code ECC200 (Ver. 2.0) • Composite Symbols Ver 1.0 (UPC-A/E, EAN8/13, JAN8/13, CODE39, CODE128 CC-A/B/C supported with RSS-14)		
Stored Font Types	**Standard**	XU 5 x 9 dots (alphanumeric, symbol, and kana) XS 17 x 17 dots (alphanumeric, symbol, and kana) XM 24 x 24 dots (alphanumeric, symbol, and kana) XB 48 x 48 dots (alphanumeric, symbol, and kana) XL 48 x 48 dots (alphanumeric, symbol, and kana)		
	Outline font (alphanumeric, symbol, and kana)	OCR-A for 203/305/609 dpi (15x22, 22x33 and 44x66 dots respectively) OCR-B for 203/305/609 dpi (20x24, 30x36 and 60x72 dots respectively)		
	Raster Fonts	CG Times, CG Triumvarite		
Print Magnification		Vertical 1 to 12 times Horizontal 1 to 12 times (characters) 1 to 12x (barcodes)		
Print Rotation		Characters: 0°, 90°, 180°, and 270° Barcode: Parallel 1 (0°), Serial 1 (90°), Parallel 2 (180°), Serial 2 (270°)		
Barcode Ratio		1:2, 1:3, 2:5; Arbitrary user settings allowed		
Accessories				
Options		**For PCI-bus mini slot** • Mini-sized USB I/F card • Mini-sized LAN I/F card • Mini-sized RS-232C I/F card **For Standard slot** • High Speed RS-232C (25-pin) I/F card • IEEE 1284 I/F card • USB I/F card • Wireless LAN (802.11b) I/F card • RS-422/485 I/F card	• 10/100 Mbps LAN I/F card • Centronics I/F card **For EXT slot** • EXT connector (Amphenol 14-pin or D-Sub 25-pin for connection to peripherals) **Other options** • Linerless option kit • I-mark sensor kit for detecting top-side I-marks	• Ribbon Loading Cassette (factory option) • Ribbon Saver option • Compact Flash memory card • RFID Kit • LVDS Kit (a cable for allowing the operational panel to be accessed from a few meters away

1.1 GENERAL SPECIFICATIONS (CONT'D)

Specification/ Model Name	Model S8408	Model S8412	Model S8424
Physical Characteristics			
Dimensions	W 245 mm x D 408 mm x H 300 mm (Basic Chassis without handles and interfaces) W 245 mm x D 478 mm x H 300 mm (Chassis with handles and interfaces installed) W 245 mm x D 417 mm x H 300 mm (Ribbon direct and interfaces installed)		
Weight	15.5 kg for a standard configuration; 16.0kg for configuration with ribbon cassette		
Power Supply	Input voltage: AC 100 V to 240 V ±10%, 2.7 A to 1.1 A		
Power Consumption	220 W (peak)		
Standards Compliance	Noise emission: VCCI Class B, FCC Class B, ENN55022 Class B Safety Standards: MET, NEMKO-GS, CCC Energy Saving: International Energy Star Program Environmental Conservation: Manufactured according to environment friendly processes In-house equipment level: Class B conformance Package Fall: ISTA-2A		
Operating Environment	Operational ambient temperature: -5 to 40 degrees Celsius Operational ambient humidity: 15 to 85% (no condensation)		

2

INSTALLATION

This section assists you in unpacking and installing the printer from the shipping container. You will also be guided through a familiarization tour of the main parts and controls. The following information is provided:

- Safety Precautions
- Unpacking and Parts Identification
- Loading the Carbon Ribbon (with and without the optional Ribbon Cassette)
- Loading Labels and Tags (with and without the optional Ribbon Cassette)
- Adjusting the Sensors
- Replacing the Print Head

SAFETY PRECAUTIONS

Please read the following information carefully before installing and using the printer

THE CAUTION SYMBOL ⚠

Whenever the triangular Caution logo appears in this manual, pay special attention to the warning(s) cited below it. Failure to abide by the warnings may result in injury or damage to property.

PRINTER PLACEMENT TIPS

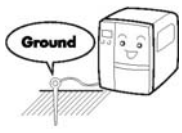
- Place the printer on a solid, stable, horizontal surface that is not subject to strong vibrations from adjacent mechanical devices.

- Avoid shaky or slanting tables, or platforms that are liable to collapse under a heavy weight. If the printer is dropped or damaged, immediately turn off the power, pull out the power plug and contact a service center. In this case, continued use of the printer may cause a fire or electric shocks.
- Avoid installing the printer in direct sunlight, or in dusty, very hot or slippery areas. Also avoid placement in damp, unventilated or humid areas. If condensation forms, immediately turn off the power, and do not use the printer until the condensation disappears. Otherwise the moisture may cause electric shocks.
- Avoid placing the printer near large high-current equipment, as such equipment can cause spikes or undervoltages in the power supply.
- Do not leave containers of water or chemicals around the printer. If any liquid is spilled onto the printer, immediately turn off the power, pull out the power cable from the AC outlet, and contact a sales outlet, dealer, or service center. In this case, continued use of the printer may cause fires or electric shocks.

- Do not move the printer with any paper loaded. The stack of paper may fall off, causing trips and accidents.
- When laying the printer down, be careful not to catch your foot or fingers under it.
- When moving the printer, be sure to pull out the power cable from the AC outlet, and check that any other external interface cables have been disconnected. Otherwise, the connected cables may be damaged, or may cause trips and falls, in addition to or a fire or electric shocks.

ELECTRICAL PRECAUTIONS

- Do not damage, break, or process the power cable. Hanging heavy objects on it, heating or pulling it may damage the power cable and cause fires or electric shocks.
- When the power cable is damaged (cable conductors are exposed or cut, etc.), contact a sales outlet, dealer, or service center. In this case, continued use of the printer may cause fires or electric shocks.
- Do not process, forcibly bend, twist, or pull the power cable. Continued use of such a cable may cause fires or electric shocks.
- If the printer emits any smoke or peculiar odors at any time, turn it OFF and prevent further usage until you have contacted a qualified service personnel.
- Do not use any other voltage except the specified power voltage for the printer that matches your domestic power supply. Otherwise, it may cause fires or electric shocks.
- Do not operate the power switch or handle the power cable with a wet hand.
- Do not insert or drop anything metallic or flammable into the openings of the printer (the cable outlet or mounting hole of the memory cartridge). Otherwise, immediately turn off the power, pull out the power cable, and contact a sales outlet, dealer, or service center. In this case, continued use of the printer may cause fires or electric shocks.
- To reduce electrical risks, be sure to connect the printer to ground before use. Also, try not to share the printer's AC outlet with other electrical equipment, especially those that draw high amounts of current or cause electrical interference.



GENERAL PRECAUTIONS	
• Head cleaning liquid (if supplied) is flammable. Never heat it or throw it into a fire. Keep it out of children's reach to avoid accidental consumption. Should this occur, consult a doctor immediately. • When opening/closing the cover, beware of getting your fingers caught. Also, hold the opening/closing cover well so that it will not slip and fall on your hand. • After printing, the print head remains hot. When replacing paper or cleaning the printer immediately after printing, be careful not to burn yourself. • Touching even the edge of the printer head may cause injuries. When replacing paper or cleaning the printer, be careful not to hurt yourself. • If the printer will not be used for extended periods of time, disconnect the power cable for safety. • When releasing and locking down the printer head, be careful not to catch any other foreign matter in it except label paper.	• Do not disassemble or perform modifications to the printer, as this renders the product unsafe. For maintenance, troubleshooting and repairs, consult a sales outlet, dealer, or service center for help, instead of attempting to perform this yourself. Renewable annual service contracts are available. • When maintaining or cleaning the printer, always disconnect the power cable for safety. • Do not insert your hand or other objects into the cutter. • When loading roll paper, be careful not to catch your fingers between the paper and the feeder. • Be careful not to hurt yourself when detaching the back cover of the fanfold through the hole and attaching it. • The simplified cutter (where installed) is structured as a blade. Be careful not to cut yourself.

This equipment is a piece of Class B information technology equipment based on the standards of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). Although this equipment is for use in home environment, if it is used close to a radio or television set, it may cause poor reception. Handle it properly in accordance with the content from the instruction manual.

SECTION 2: INSTALLATION

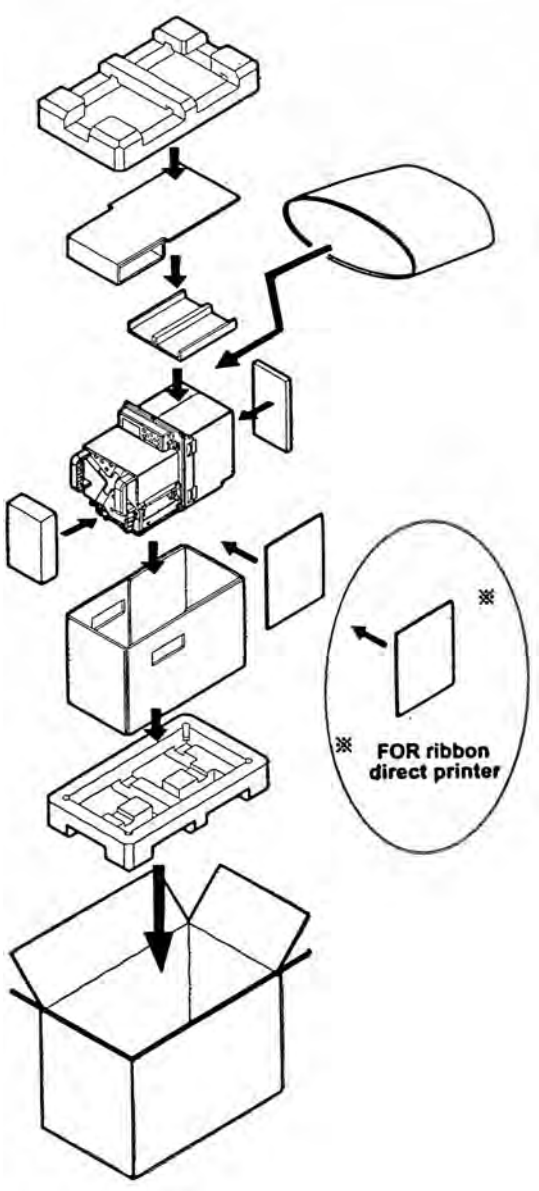
2.1 UNPACKING

When unpacking the printer, take note of the following:

1 The box should stay right-side up. Lift the printer out of the box carefully.	**4** If the printer was been stored in the cold, allow it to reach room temperature before turning it on.
2 Remove the plastic covering from the printer.	**5** Set the printer on a solid, flat surface. Inspect the shipping container and printer for any sign of damage that may have occurred during shipping.
3 Remove the accessory items from their protective containers.	

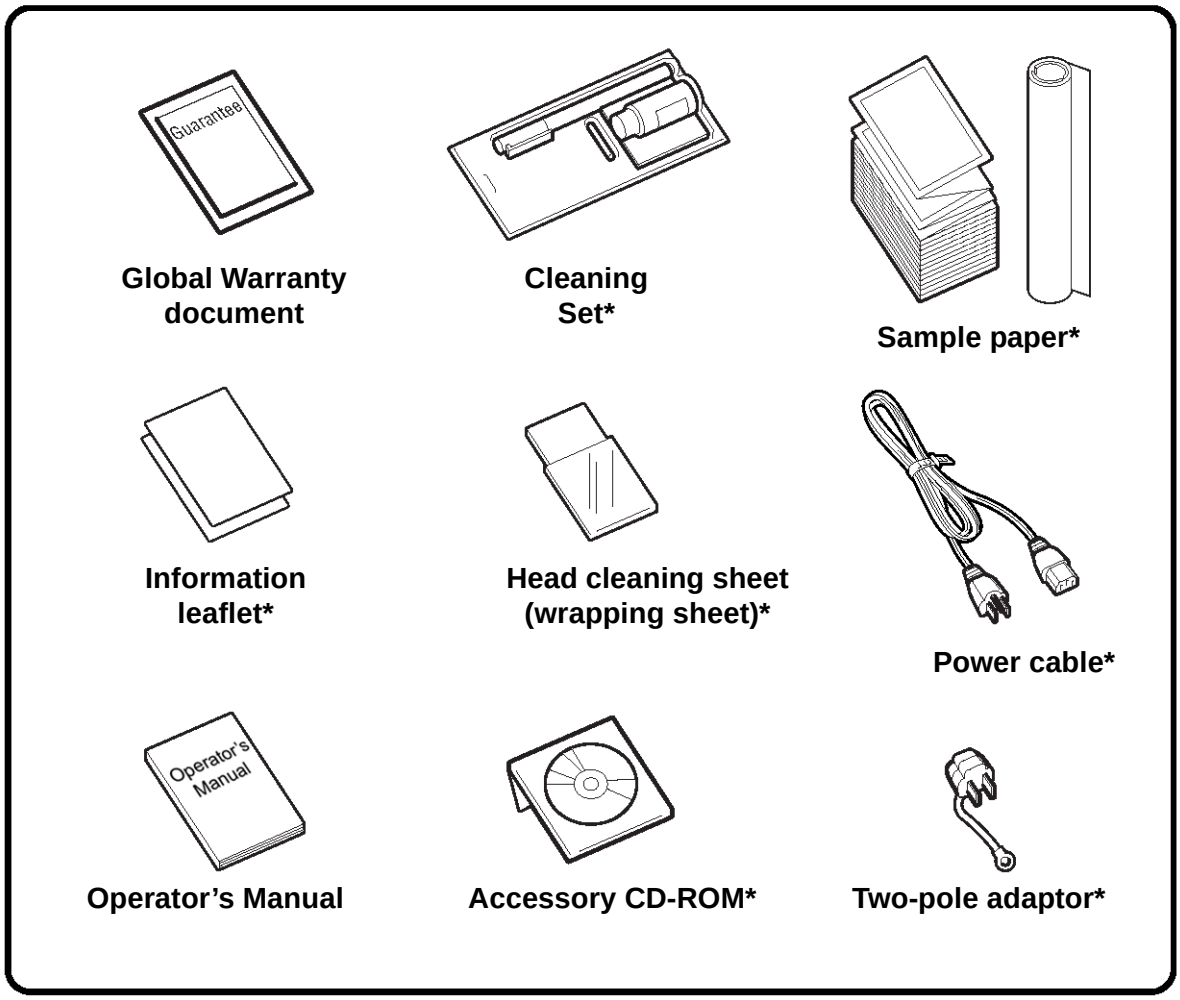
Note

The following illustrations are representative only. Your printer may not be packed exactly as shown, but the unpacking steps are similar.

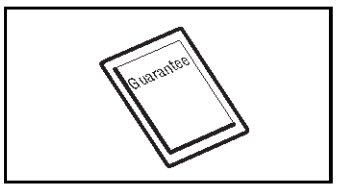


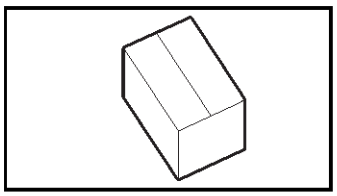
2.1.1 Included Accessories

After unpacking the printer, verify that the following materials are in the accessories or packaging:



Items marked with an asterisk may be different from what you see here, or may be excluded.





Important!

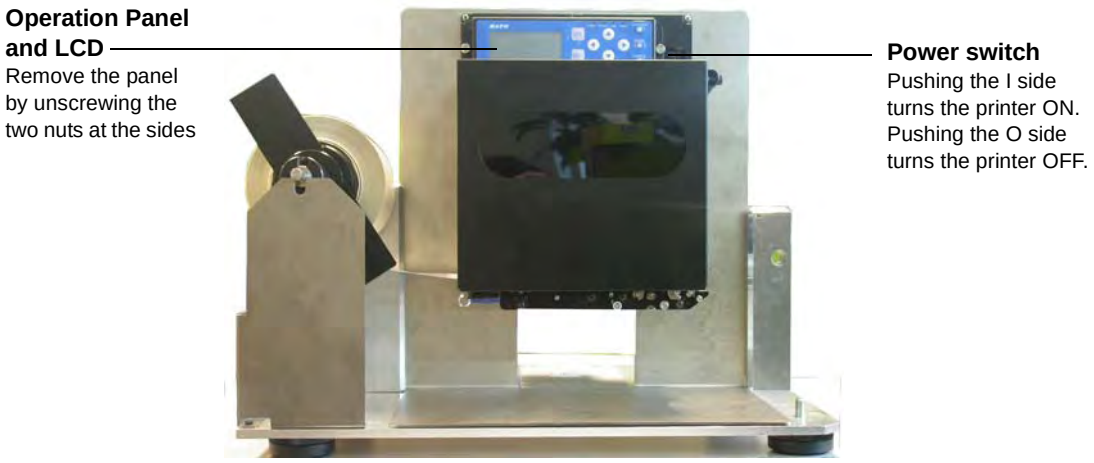
Please fill out the Global Warranty card and submit it to us in order that we can provide fast and efficient after-sales service. For malfunctions under **normal usage**, this product will be repaired free of charge according to the warranty terms applicable for the country of use.

Please do not discard the original packaging box and cushioning material after installing the printer. They may be needed in future, if the printer needs to be shipped for repairs.

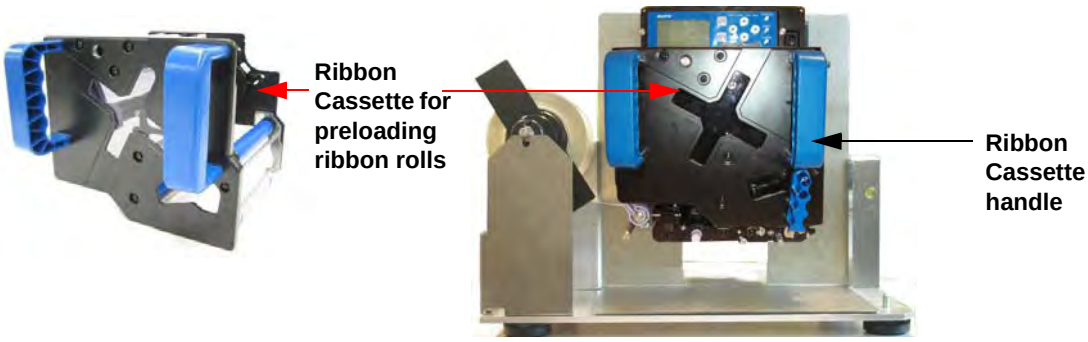
2.1.2 Parts Identification

IDENTIFYING THE MAIN PRINTER PARTS

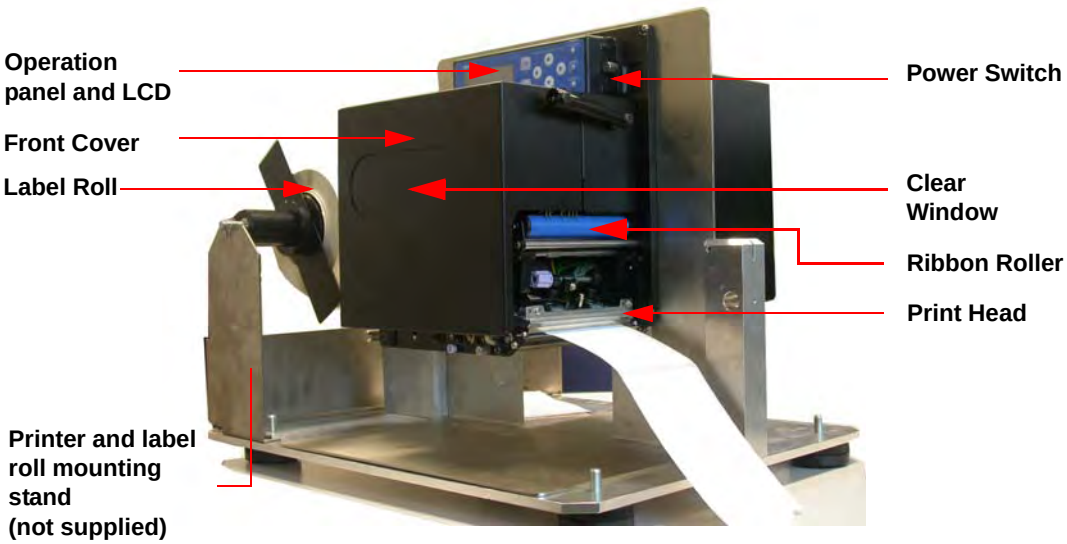
Front View (Left Hand model)


Operation Panel and LCD
Remove the panel by unscrewing the two nuts at the sides
Power switch
Pushing the I side turns the printer ON. Pushing the O side turns the printer OFF.

Front View (Left Hand model with optional Ribbon Cassette frame)



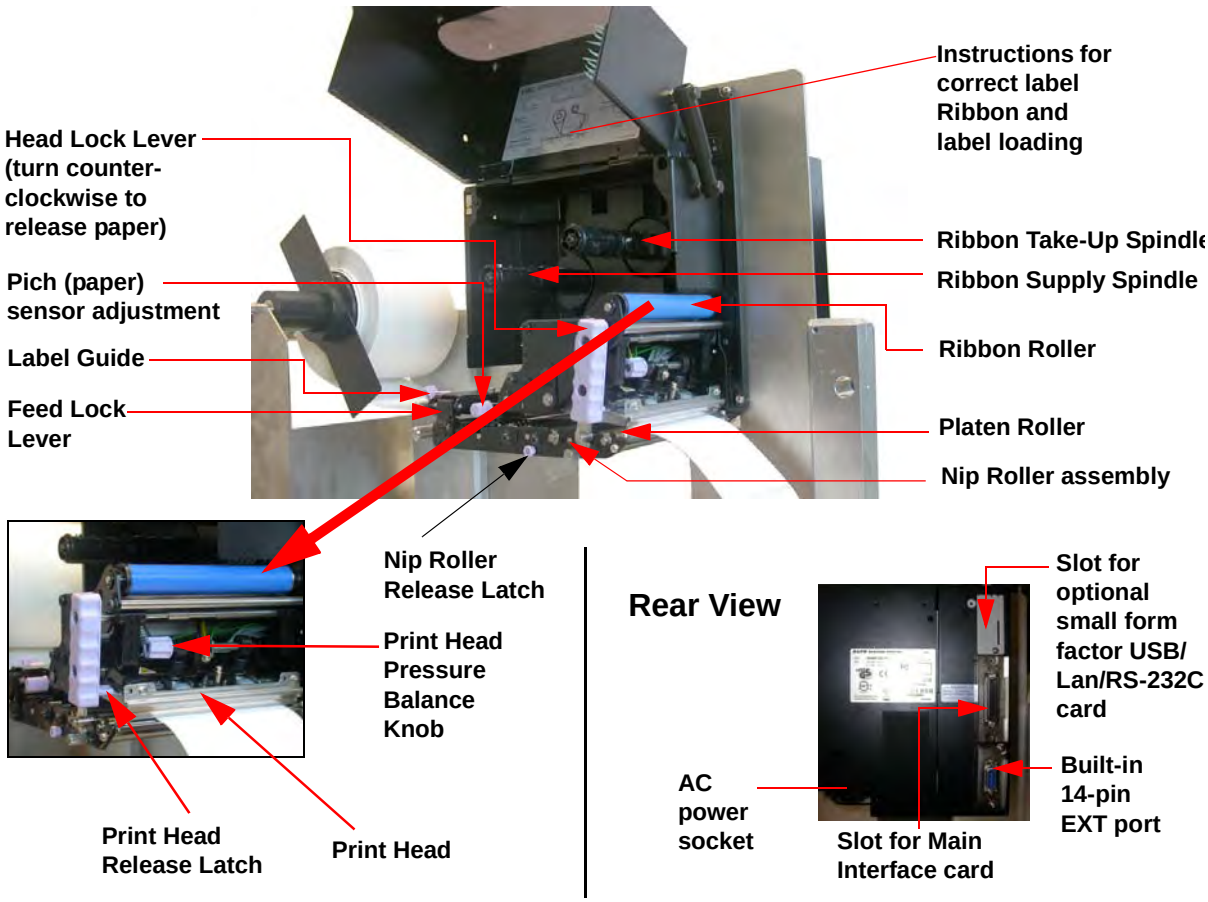
Angled Front View (Left Hand model)



2.1.2 PARTS IDENTIFICATION (CONT'D)

IDENTIFYING THE MAIN PRINTER PARTS

Front View, Cover open
(Left-hand model)



Rear View

Slot for optional small form factor USB/ Lan/RS-232C card
Built-in 14-pin EXT port
AC power socket
Slot for Main Interface card

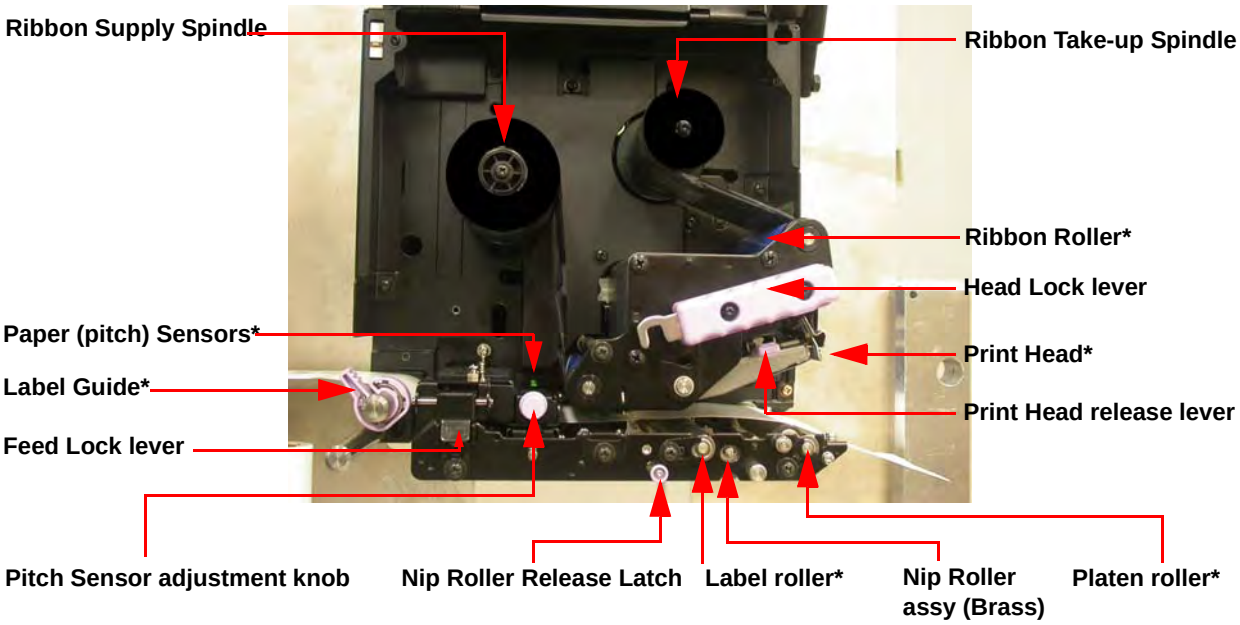
Internal mechanism of S8400 with Ribbon Cassette

Ribbon cassette

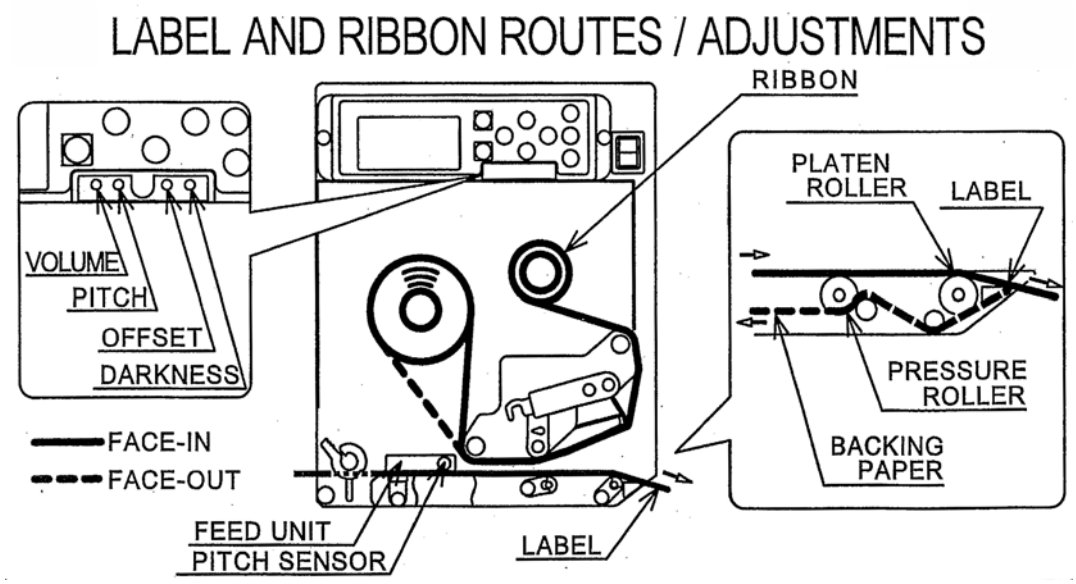
This is where the ribbon is loaded, wound and rewound.

IDENTIFYING THE MAIN PRINTER PARTS

Media Path Parts



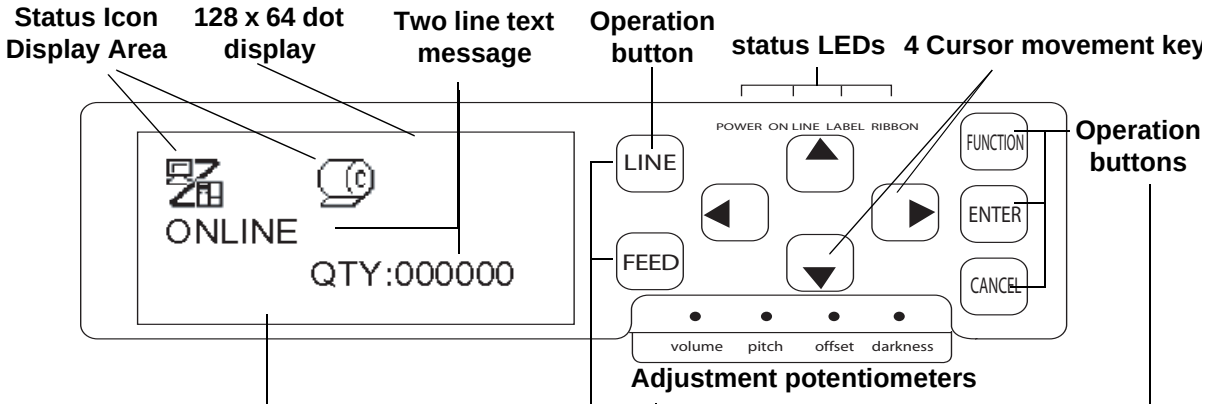
*** Clean and maintain this part regularly**



2.1.2 PARTS IDENTIFICATION (CONT'D)

IDENTIFYING THE MAIN PRINTER PARTS

View of Front Panel



LCD screen

Icons, prompts and system messages are displayed here.

LINE button

Takes the printer ONLINE (to proceed with printing) or OFFLINE (to perform configuration or other settings)

FEED button

Feeds the label forward. When it is pressed once, the equivalent of a sheet of paper or label is ejected. **There are times when the paper is not aligned properly when power is turned on or when the paper was set. In this case, always press the FEED button to align the paper properly.*

Status LEDs

POWER LED: Lights up when power is supplied to the printer.

ONLINE LED: Lights up when communication is available.

LABEL LED: Lights up red at Paper End or Paper Near End.

RIBBON LED: Flashes red when detecting Ribbon Near End. Lights up red when detecting Ribbon End.

CANCEL button: Cancels printing data. In each setting mode, the button also returns you to the previous menu or menu item.

For details of each indicator's behavior, see **Page 6-4 of Section 6, Understanding the LED Indicators.**

Operation buttons

FUNCTION button: Selects the various setting modes.

ENTER button: Confirms the choice of a selection or value.

CANCEL button: Cancels printing data. In each setting mode, the button also returns you to the previous menu or menu item.

CURSOR buttons: Each button moves the cursor up, down, left or right on the LCD screen.

Adjustment Potentiometers

VOLUME: Adjusts the loudness of the built-in speaker (buzzer).

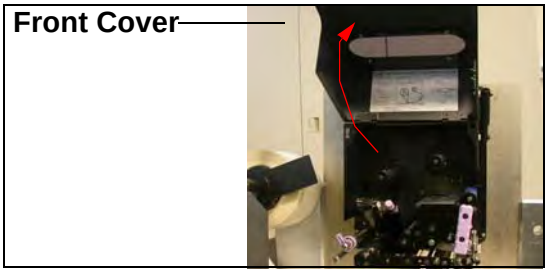
PITCH: Adjusts the vertical print position with reference to the top edge of a label.

OFFSET: Adjusts the stop position offset values for the cutter, peeler and tear off modes

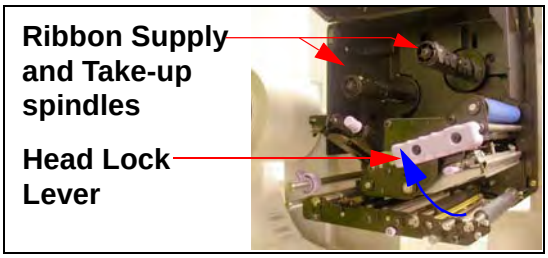
DARKNESS: Adjusts the print darkness (print density).

2.2 LOADING THE CARBON RIBBON

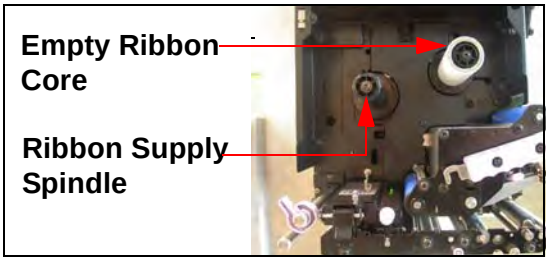
1. Lift up the front cover. Make sure that the cover is pushed upwards until it locks firmly in place so that it will not fall downwards and injure your hands.



2. Pull the purple Head Lock lever upwards in a clockwise direction. The print head assembly will be lifted up to allow ribbon loading.

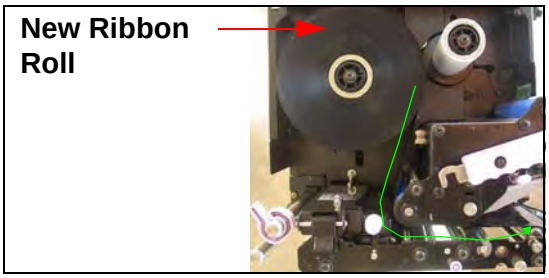


3. Insert the carbon ribbon in the ribbon supply spindle.
   Push the ribbon roll inwards all the way, with the ribbon winding in a counterclockwise direction, as shown. Pull the ribbon around the print head assembly so it reaches the Ribbon Take-up Spindle.
   Note: For maximum print quality and printer durability use genuine SATO carbon ribbons.



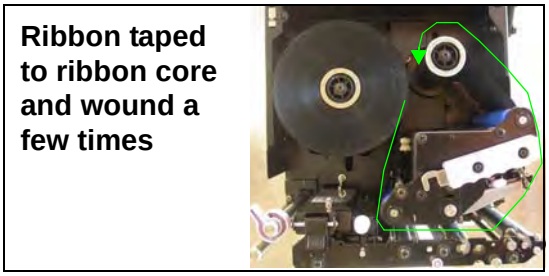
4. Insert an empty ribbon core into the Ribbon Take-Up Spindle. If necessary, secure the ribbon with adhesive tape, and wind the ribbon around the core a few times.

   Note:
   If in doubt about the ribbon path, refer to the useful diagram pasted on the front cover.



5. Press the purple Head Lock lever clockwise and downwards to lock the print head assembly into place. The ribbon is now loaded.

   Note:
   To remove the ribbon, reverse the steps described here.

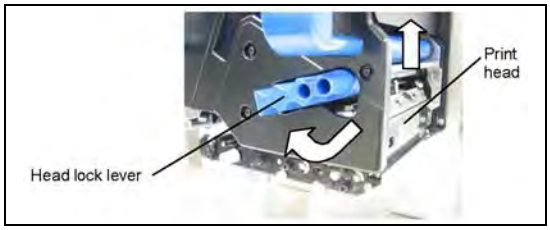


⚠ Caution

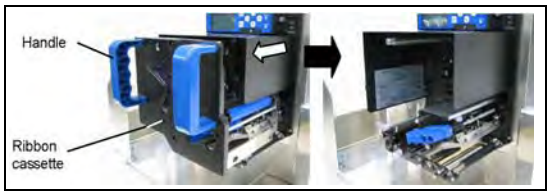
- When replacing the carbon ribbon, bear in mind that the print head and its surrounding area remain hot. Keep your fingers away from these areas to prevent injury.
- Avoid touching even the edge of the print head with your bare hands.

2.2 LOADING THE CARBON RIBBON ON A CARTRIDGE-BASED S8400

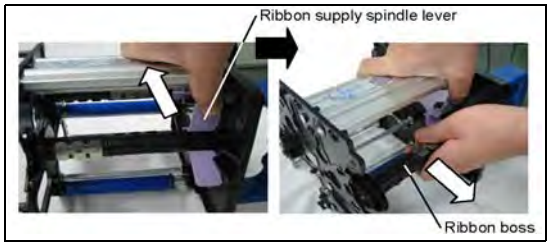
1. Pull the blue Head Lock lever upwards in a clockwise direction. The print head assembly will be lifted up to allow ribbon loading.



2. Remove the Ribbon Cassette frame by pulling it by the two blue handles.



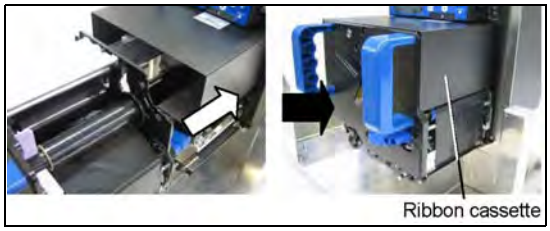
3. Push and open the purple lever to remove the ribbon boss.



4. Wind the leader tape of a fresh ribbon roll around the ribbon take-up spindle, using the Surface-Out or Surface-In orientation as appropriate. Load the ribbon roll and ribbon supply-spindle into the ribbon cassette. Turn the ribbon take-up spindle to tighten any sagging in the carbon ribbon.

   Note: *For maximum print quality and printer durability use genuine SATO carbon ribbons.*

5. Reinsert the ribbon cassette into the printer chassis by holding the handles.



6. Press the blue Head Lock lever counterclockwise to lock the print head assembly into place. The ribbon is now loaded.

   Note:
   To remove the ribbon, reverse the steps described here.

⚠ Caution

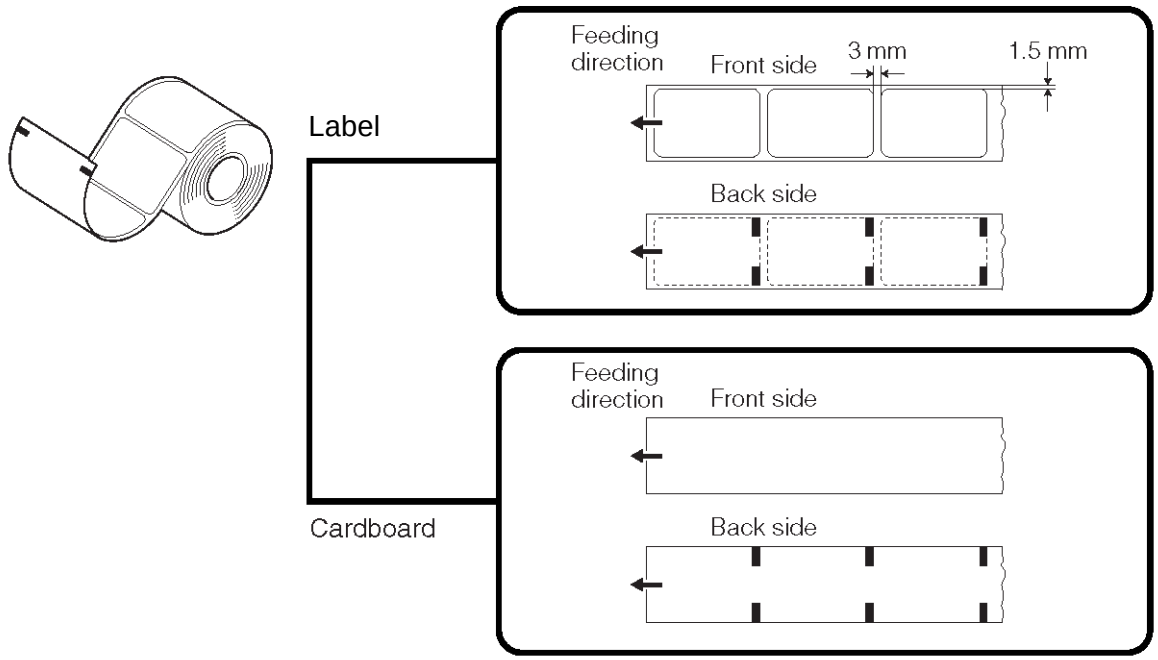
- When replacing the carbon ribbon, bear in mind that the print head and its surrounding area remain hot. Keep your fingers away from these areas to prevent injury.
- Avoid touching even the edge of the print head with your bare hands.

2.3 LOADING LABELS

This print engine is designed to print on **roll paper** supplied via a separate label supply stand. The printing mechanism can be set to detect the I-mark on the paper to feed each label correctly.

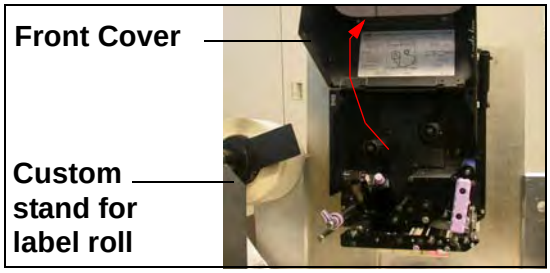
Note:
For optimal print performance and durability, **please use SATO-certified label and ribbon supplies on this printer.** Using supplies not tested and approved for use by SATO can result in unnecessary wear and damage to vital parts of the printer, and may void the warranty.

Roll Paper Characteristics

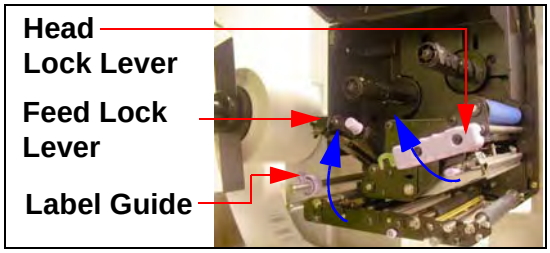


2.3.1 Loading Roll Paper

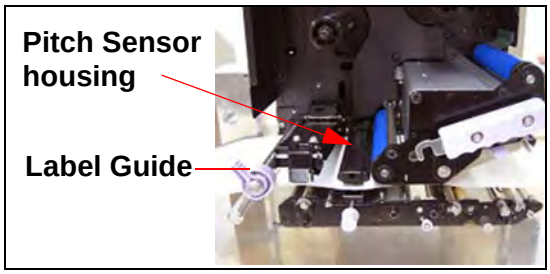
1. Lift up the front cover. Make sure that the cover is pushed upwards until it locks firmly in place so that it will not fall downwards and injure your hands.
   Use a customized stand to hold the label roll.



2. Release the purple Head Lock lever by pushing it downwards. The print head assembly will be lifted up to allow label loading. Push up the Feed Lock Lever.



3. Guide the label between the two halves of the Pitch (paper) Sensor housing, and then under the print head. Make sure the label runs parallel to the side of the printer. The label should emerge at a perpendicular angle from the print head.



4. Push the Label Guide against the outside edge of the label to restrict and straighten the label path. Now turn the purple Head Lock Lever counterclockwise to latch the print head assembly back in place.

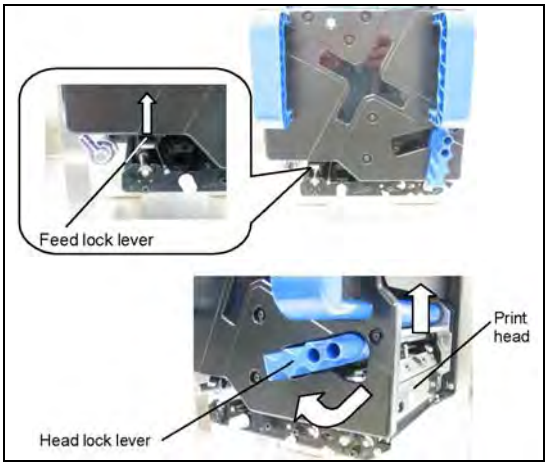
5. To check whether label roll is loaded correctly, perform a test print. (Install a ribbon roll if you are not using direct thermal paper)

⚠ Caution

- When replacing paper, bear in mind that the print head and its surrounding area remain hot. Keep your fingers away from these areas to prevent injury.
- Avoid touching even the edge of the print head with your bare hands.

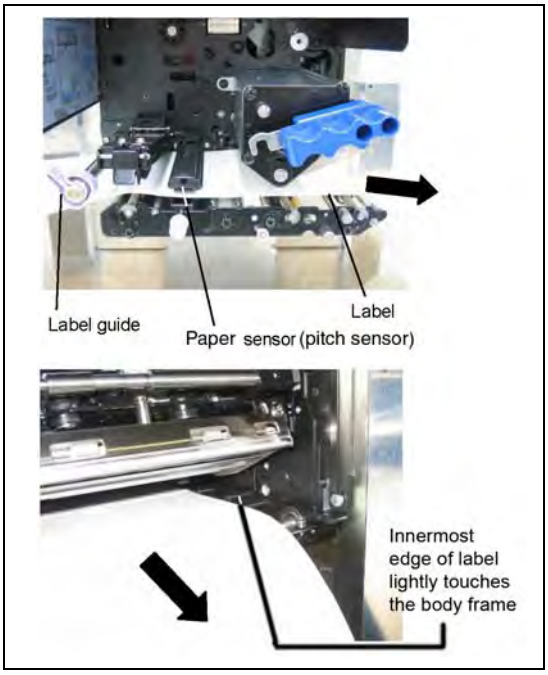
2.3.1 Loading Paper **(Ribbon Cassette installed)**

1. Turn the blue head lock lever clockwise to allow the ribbon cassette to be removed. Remove the ribbon cassette and then push up the feed lock lever.

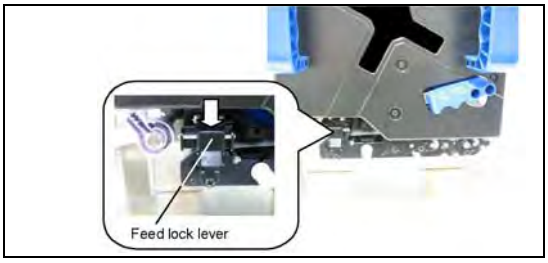


2. Pull the label guide outward and guide the label roll between the two halves of the Pitch Sensor housing, and then under the print head. Make sure the label runs parallel to the side of the printer. The label should emerge at a perpendicular angle from the print head.

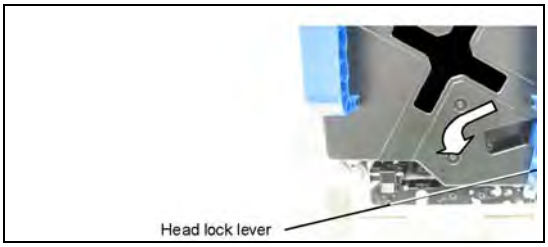
4. Push the Label Guide lightly against the outside edge of the label to restrict and straighten the label path. The same applies to the innermost edge of the label at the print head area of the body frame.



5. Push down the feed lock lever to lock the label path in place.



7. Finally, latch the print head by turning the Head Lock lever counterclockwise.



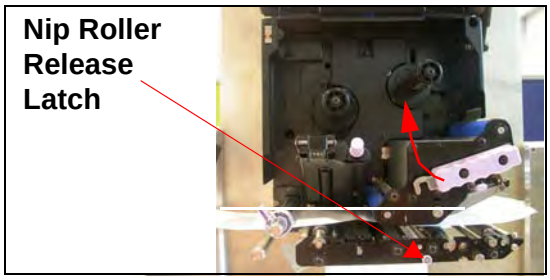
⚠ Caution

- When replacing paper, bear in mind that the print head and its surrounding area remain hot. Keep your fingers away from these areas to prevent injury.
- Avoid touching even the edge of the print head with your bare hands.

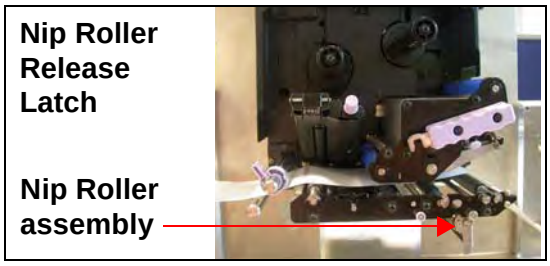
2.3 LOADING LABELS AND TAGS (CONT'D)

2.3.2 Using the Dispenser

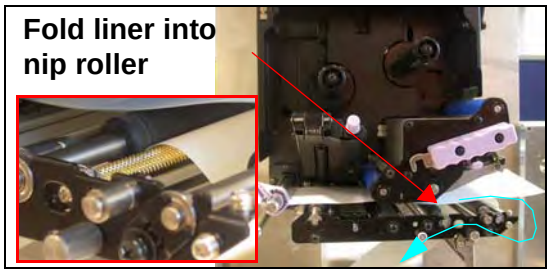
1. Load the paper as described in the previous section.



2. Now unlatch the Nip Roller (also called the Pressure Roller) assembly by pressing the release latch as indicated on the right.

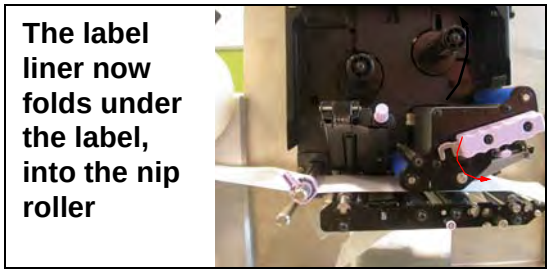


3. Remove three or four labels from the label roll and loop the liner from the print head area so that some exposed liner is threaded into the nip roller. One label will be half removed from the liner at the front of the printer (see the cyan line for the liner path).



4. Press the Nip Roller assembly upwards and latch it into place.

5. Latch the print head with the Head Lock level. To check that the labels are dispensed properly, do a paper feed. If necessary, go to User Mode to adjust the paper offset for proper dispensing.



⚠ Caution

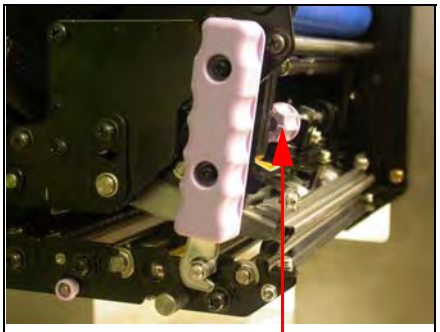
- When replacing paper, bear in mind that the print head and its surrounding area remain hot. Keep your fingers away from these areas to prevent injury.
- Avoid touching even the edge of the print head with your bare hands.

2.3 LOADING LABELS AND TAGS (CONT'D)

Adjusting for the paper width
This printer is adjusted so that quality printing can be obtained without any adjustments. However, in certain situations, better results can be obtained if you adjust the "head pressure balance" to compensate for different widths of label paper used.

The head pressure balance knob adjusts the amount of pressure being applied along different sections along the length of the print head. For suggested settings of the pressure knob (1 to 4), see the table below:

SETTING	PAPER WIDTH	MEDIA THICKNESS
1	55~115 mm	0.080~0.200 mm
2	65~115 mm	0.200~0.268 mm
3	15~55 mm	0.080~0.200 mm
4	15~65 mm	0.200~0.268 mm



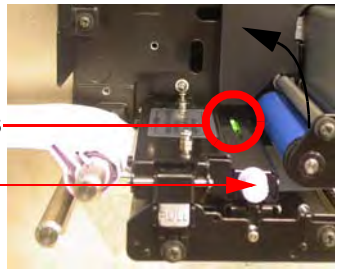
Print Head Pressure Balance knob

Note:
Adjustments are only necessary if print quality is not satisfactory. Otherwise, you do not need to vary the head pressure balance.

2.3.3 Adjusting the Pitch Sensor

Adjustment of the pitch sensors is usually not necessary, but the procedure is described here.

1. Lift up the front cover. Make sure that the cover is pushed upwards until it locks firmly in place so that it will not fall downwards and injure your hands.

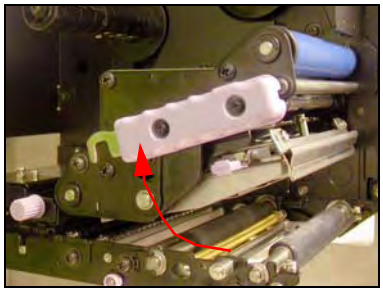


2. The green sensor assembly is located just under the Ribbon Supply Spindle. Turn the purple Sensor Adjustment knob to adjust the sensors' position. (The gap and I-mark sensors are underneath the green plastic tabs)

3. After adjustment, feed a few labels and do a test print to see if the sensor is working properly. Adjust the label pitch if necessary.

⚠ Caution
• When closing the front cover, be careful not to injure your fingers due to a sudden release of the heavy cover.

2.4 CHANGING OR REPLACING THE PRINT HEAD



Before attempting to replace the print head, it is advisable to contact your local dealer or service center so that they can assist you in case of problems.

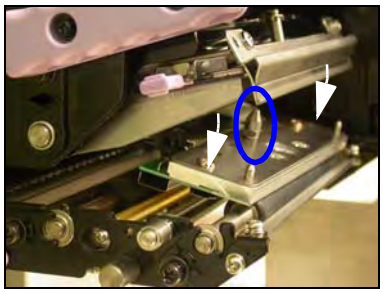
The S8400 series is designed for tool-less easy attachment and detachment of the print head.

1. Make sure the printer has been turned off for at least 30 minutes so that the print head is not hot. Lift up the front cover.

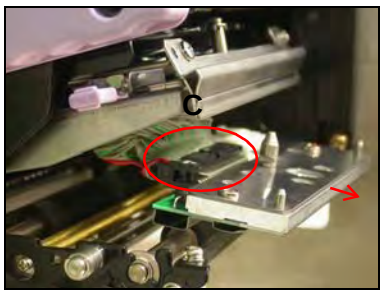
2. Push the Head Lock Lever (the purple slide lever) upwards. in the direction shown here.

⚠ Caution

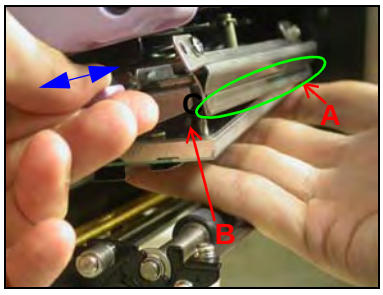
- Do not touch the print head's heating elements. If you do so inadvertently, use the cleaning pen (supplied) to clean the area thoroughly. For more details, see Section 4, Cleaning and Maintenance.



3. Pull up the Print Head Release Latch (circled in red). The print head will drop downwards. Note the tall metal **locking pin** (circled in blue) in the centre of the print head. A spring loaded plate (controlled by the Print Head Release Latch) is pressed against the sides of this locking pin to fasten the print head in place.



4. Pull the print head outwards and disconnect the two cables and connectors attached to it. Connect a replacement print head to the two connectors.



5. Insert the print head back into the printer starting from the point labeled A here. Make sure the front-most part of the print head makes contact with the plate circled green.

6. While pulling the print head release latch, push the area labeled B upward until the print head is horizontal. Let go of the release latch so that the spring loaded plate inside will press against the central **locking pin** to hold the print head in place.

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3

OPERATION AND CONFIGURATION

Before using the printer, it is best to read this manual thoroughly first. Otherwise, you may disturb default settings around which the instructional procedures in this manual are based on.

3.1 OPERATING MODES

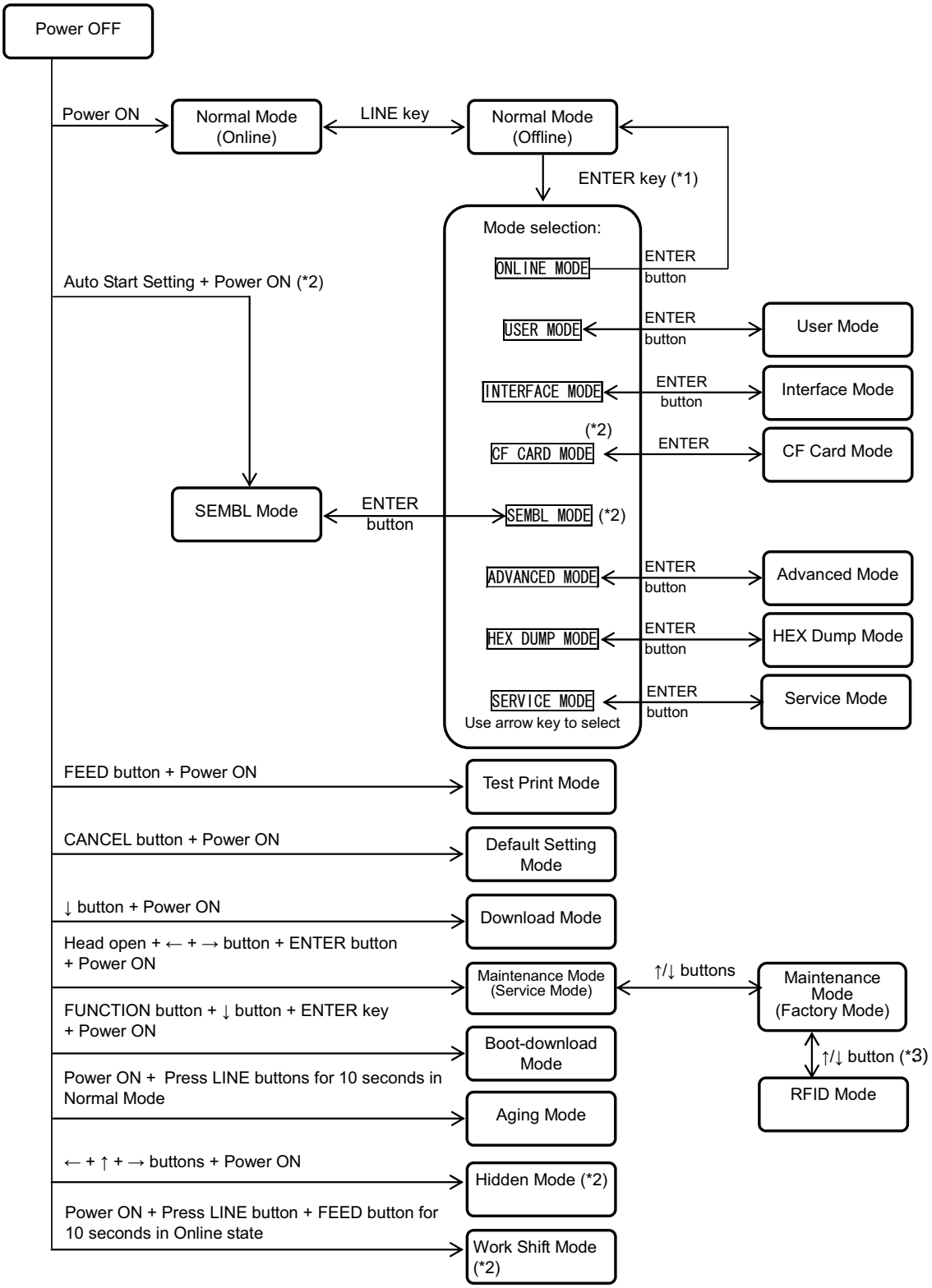
The operating status of this printer can be set within one of the following modes:

1) Normal mode (including Online/Offline modes)
2) SEMBL mode (standalone operation on user program based on BASIC language)
3) Printer Setting:
   - User mode
   - Interface mode
   - CF Card mode
   - Advanced Mode
   - Hex Dump mode
   - Service mode
4) Error mode
5) Test Print mode
6) Default Setting mode
7) Download mode (See Service Manual)
8) Maintenance Mode (See Service Manual)
9) RFID mode (See Service Manual)
10) Boot Download mode
11) Simple Standalone Mode
12) Work Shift mode

The various modes are accessed by pressing the operation buttons, power button and LCD screen while the printer is OFF, ON or in a certain condition such as having its head unlatched or with certain printer settings in force.

The following table provides a clear summary of all the modes and their access method.

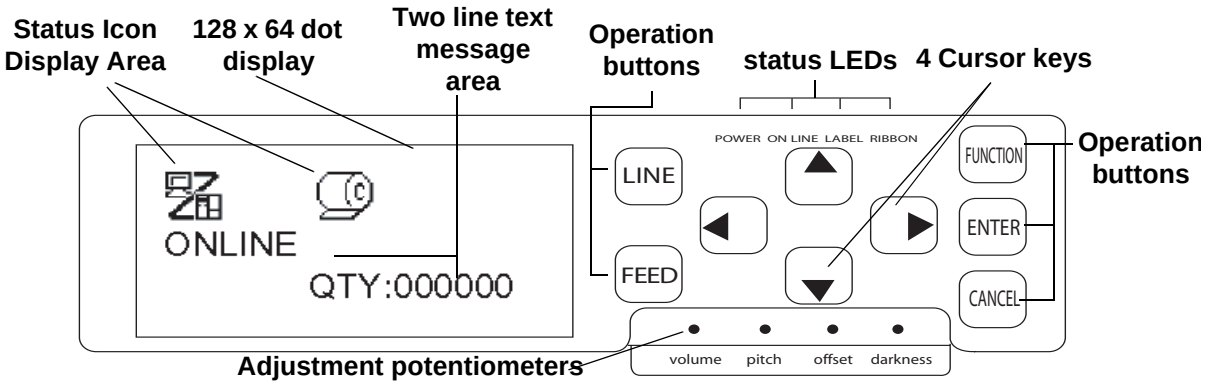
The operation flowchart is as follows:



*1 Valid when there is no print data
*2 Valid for the printer S8400 series
*3 Valid when RFID options is applied

3.2 THE OPERATION PANEL

Overview



Status Icon display area

Up to five icons can appear here to indicate the current printer status.
The same area can also display two lines of alphanumeric text instead.

Status LEDs

POWER: This LED lights Green when power is supplied to the printer

ON LINE: Lights up Green when printer is in "Online" state. Otherwise, LED is not lit.

LABEL: Lights up Red at "Paper end"

RIBBON: Normally does not light up until Ribbon End is detected. Just before Ribbon End, the LED blinks in red, signalling "Ribbon near end" status.

Adjustment Potentiometers

Volume: Adjusts the loudness of the built-in buzzer

Pitch: Adjusts the print position in User Mode (OFFSET VOLUME menu)

Offset: Adjusts the offset for Dispense offset

Darkness: Adjusts the print darkness User Mode (OFFSET VOLUME menu)

Two-line Message display area

Other icons, or up to two lines of alphanumeric messages, can be displayed here.

In total, up to four lines of text can be displayed on the whole screen.

Operation and Cursor buttons

LINE: Switches between online and offline modes. Not valid for other settings.

FEED: Feeds a single label feed only when in offline mode. Not valid for other settings.

FUNCTION: Recalls the Mode Selection screen for selection of various function menus. Also returns the user to the mode selection screen from other menus.

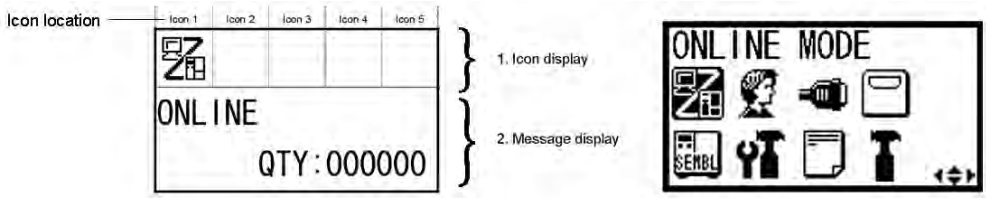
ENTER: Selects a menu item in any screen in offline mode. Button is inactive when the printer is online.

CANCEL: Cancels print data in the OFFLINE state. Button is inactive when the printer is online**.** Also returns the user to a previous menu screen.

Four cursor movement buttons:

These cause the cursor to shift Up, down, Left and Right on the screen.

3.3 SCREEN ICONS AND THEIR MEANING



【Mode display】 〈List of icons〉

No.	Icon	Description	Display position
1		Displayed when the printer is online	Icon 1
2		Displayed when the printer is offline	Icon 1
3		Displayed when the printer is in Test Printing Mode and Dump Printing Mode	Icon 1
4		Displayed when the printer is in Download Mode	Icon 1
5		Displayed when the printer is in Upload Mode	Icon 1

【Mode selection screen】

No.	Icon	Description	Display position
1		Switches the printer to Normal Mode	—
2		Switches the printer to User Mode	—
3		Switches the printer to Interface Mode	—
4		Switches the printer to CF Card Mode	—
5		Switches the printer to SEMBL Mode	—
6		Switches the printer to Advanced Mode	—
7		Switches the printer to Hex Dump Printing Mode	—
8		Switches the printer to Service Mode	—

【Error-related】

No.	Icon	Description	Display position
1		Displayed when label end is detected	Icon 1
2		Displayed when ribbon end is detected	Icon 1
3		Displayed when sensor error is detected	Icon 1
4		Displayed when head open is detected	Icon 1
5		Displayed when head element failure is detected	Icon 1
6		Displayed when a communication error is detected	Icon 1
7		Displayed when a receive buffer error is detected	Icon 1
8		Displayed when a item No. error or BCC error is detected	Icon 1

3.3 SCREEN ICONS AND THEIR MEANING (CONT'D)

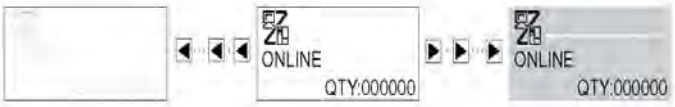
No.	Icon	Description	Display position
10		Displayed when there is a calendar error	Icon 1
11		Displayed when a printer error other than the above is detected	Icon 1
12		Displayed when any RFID error has occurred	Icon 2
13		Displayed when an error is detected in the Kanji ROM	Icon 2
14		This icon displays the error number for reference	Icon 2

【Warning-related】

No.	Icon	Description	Display position
1		Displayed when ribbon near end is detected.	Icon 3 to 5
2		Displayed when label near end is detected.	Icon 3 to 5
3		Displayed when command error is detected.	Icon 3 to 5
4		Displayed when receive buffer near full is detected.	Icon 3 to 5
5		Displayed when head element failure is detected	Icon 3 to 5
6		Displayed when internal overheating is detected	Icon 3 to 5

How To Adjust Screen Contrast

In Normal/ONLINE mode, press the left/right arrow buttons ◀/▶ repeatedly to adjust the contrast.



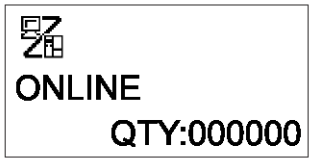
There are 32 levels of adjustments. Contrast settings are reset whenever you set the printer to factory default settings.

3.4 ONLINE AND OFFLINE MODES

The general and basic operation of the S8400 series print engine is via the Normal mode, which consists of the ONLINE and OFFLINE modes.

3.4.1 Online Mode

Pressing the **LINE** button causes the printer to go ONLINE or OFFLINE alternately.
When the printer is ONLINE, the following activities will be possible:



- The printer is ready to receive print data from the computer or other connected devices
- The printer is ready to start printing

3.4.2 Offline Mode

When the printer is ONLINE, pressing the **LINE** button once will cause the printer to go OFFLINE.

When the printer is OFFLINE, the activities for ONLINE mode are no longer possible, but the following activities will be possible:

- The printer can eject labels when you press the **FEED** button.
- The printer can be switched to other modes when you press the **ENTER** button.
- Any printing job can be PAUSED once the printer is brought OFFLINE

- Any printing job can be cancelled once the **CANCEL** button is pressed in OFFLINE mode. The menu for canceling the print job then appears. Move the cursor to “No” and press **ENTER** to confirm cancellation of the print job. The message “CANCEL PRINT JOB COMPLETED” then appears as shown on the right.

- In OFFLINE mode, press the **ENTER** button to access the icon-based printer settings menu as shown here. Using the cursor buttons, you can access the ONLINE mode, USER mode, INTERFACE mode, CF Card Mode, SEMBL mode, ADVANCED mode, HEX DUMP mode and SERVICE mode from here. These modes will be discussed in subsequent sections.

3.4.3 SEMBL Operation

If the printer has been set to SEMBL mode using the SEMBL AUTO START feature (**see “3.8.19 Specifying SEMBL AUTO START” on page 3-20**), the printer will run the SEMBL program every time it is turned ON.

3.5 USER MODE

The following settings are available in User Mode:

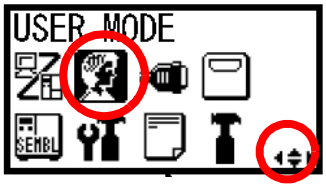
- PRINT SPEED (print speed setting)
- PRINT DARKNESS (print density setting)
- PRINT OFFSET (print position correction setting)
- ZERO SLASH (zero slash changeover setting)
- CHARACTER PITCH (proportional pitch setting)

3.5.1 Entering User Mode

1. Press the **LINE** button to take the printer OFFLINE.

2. Press **ENTER**. The ONLINE MODE screen appears.

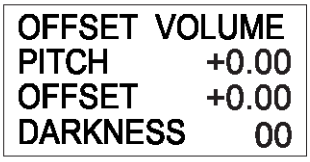
3. Press the ◀ ▶ ▲▼ arrow buttons until you see "USER MODE", then press **ENTER**.



Note:

The bottom right-hand corner of the screen sometimes displays one to four arrow symbols (see circled symbols on the right). Each arrow symbol represents the corresponding arrow button on the operation panel which is valid for the changing the current screen or its settings.

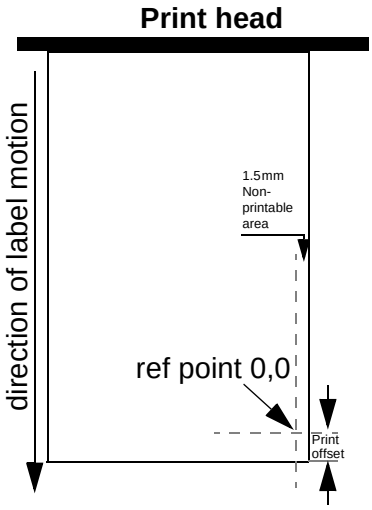
4. When the first User Mode: OFFSET VOLUME menu screen appears, use a Cross Head (Phillips) screwdriver to adjust the PITCH, OFFSET and DARKNESS potentiometers. See **Section 3.5.2 Setting Print Speed.**



5. Subsequently, pressing the **ENTER** button brings you to screens for setting PRINT SPEED, PRINT DARKNESS and OFFSET. At any time, pressing **CANCEL** takes you back one screen. Pressing the **FUNCTION** button returns you immediately to the main User Mode screen.

3.5.1 User mode (cont'd)

Next, you can use the screwdriver to rotate the potentiometer for the **Print Position** or **Reference Point**. This setting adjusts where printing begins vertically, relative to the leading edge (nearest the print head) of each label. The maximum value allowed is 3.75 mm. (See also "View of Front Panel" on page 2-9)

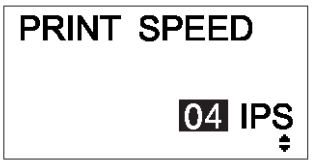


Adjusting the **OFFSET** potentiometer adjusts the dispense position.

Finally, adjusting the Print Darkness potentiometer adjusts the print darkness.

When all the settings are satisfactory, press the **ENTER** button to proceed to set other parameters in the User Mode.

3.5.2 Setting Print Speed



After setting the OFFSET VOLUME (i.e., the amount of) PITCH, PRINT OFFSET and DARKNESS, pressing **ENTER** takes you to the Print Speed setting.
This setting can be used to achieve a high print speed that does not compromise print quality.

Press the ▲▼ buttons to change the setting. Press the **ENTER** button to confirm a setting and proceed to the next screen.

If quality printing cannot be obtained due to the quality of the paper or the printing contents, lower the speed accordingly. Print speed can be set in multiples of +/- 0.5 ips.
For the 609 dpi S8400, for example, print speed can be set as follows:

Print head resolution: default print speed setting	Available print speed settings (lower numbers mean slower print speeds)
609 dpi: default 04 inches/sec	02, 03, 04, 05, 06 inches/sec

3.5.3 Setting Print Darkness

After setting Print Speed, the next screen allows you to set the Print Darkness—the darkness of the print on paper.

This setting can be set from 1 (lightest) to 5 (darkest). The default setting is 3.

Press the ◀/▶ buttons to change the setting. Press the **ENTER** button to confirm a setting and proceed to the next screen.

3.5.4 Setting Pitch Offset

After setting Print Darkness, the next screen allows you to set the Pitch Offset in millimeters.

This setting can be set from -49 mm to +49 mm. The default setting is 00.

Use the ◀/▶ and the ▲/▼ buttons to set the value in mm. **ENTER** button to confirm a setting and proceed to the next screen.

After the Pitch Offset menu, pressing ENTER returns you to the main menu containing the USER mode icon and icons of other modes. Use the cursor buttons to select other modes if you wish to change settings within those modes. Otherwise, press the CANCEL button to return to the Normal mode.

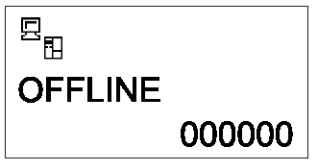
3.6 INTERFACE MODE

In this mode, you can set various parameters governing the use of interface cards. Due to the wide range of interface cards available, only the default interface configuration settings are covered in this section. A flowchart overview of advanced settings for all the optional interface cards is included at the end of this chapter, and a detailed discussion of advanced settings can be found in the Service Manual available upon request.

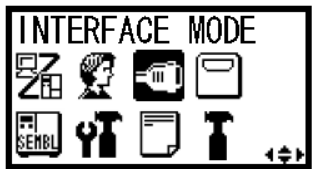
3.6.1 Entering Interface Mode

1. Press the **LINE** button to take the printer OFFLINE.

2. Press **ENTER**. The ONLINE MODE screen appears.

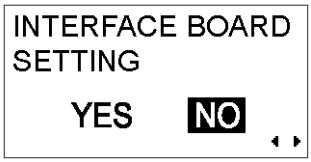


3. Press the ◀ ▶ ▲▼ arrow buttons until you see "INTERFACE MODE", then press **ENTER** to perform the first setting. At any time within this mode, pressing **CANCEL** takes you back one screen. Pressing the **FUNCTION** button returns you immediately to the main Interface Mode screen.



3.6.2 Enabling Interface Card Configuration

The first setting in the Interface Mode lets you select whether you wish to configure an interface card.

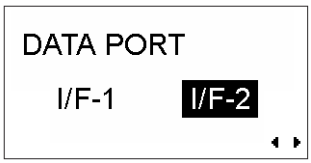


If NO is selected, the next screen is **IGNORE CR/LF (Section 3.6.3).** Press the ◀ / ▶ buttons to select either YES or NO. The default setting is NO. Press the **ENTER** button to confirm the NO setting and proceed to the next screen (see either **Section 3.6.3 or 3.6.4** on the next page).

If YES is selected, the next screen lets you select an interface card to configure.
Depending on which interface card is installed, and which settings are active, a wide range of possible screens may appear. Refer to page 3-35 to page 3-44, for detailed flowcharts of the all settings and LCD screen menus available for LAN/Wireless LAN, IEEE1284, RS-232C, Parallel and USB..

3.6.3 Data Port Assignment

The second setting in the Interface Mode lets you select Port 1 (topmost card slot) or Port 2 (middle slot) as the main data port. The default setting is I/F-2, which is the port supplied by a standard interface card.



Press the ◀ / ▶ buttons to select either I/F-1 or I/F-2. Press the **ENTER** button to confirm the setting and proceed to the next screen.

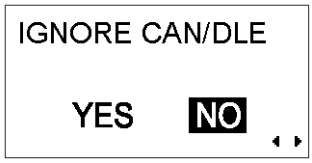
3.6.4 Handling CR/LF CODES

This setting determines whether Carriage Return and Line Feed codes are processed or ignored. It only appears when an IEEE1284 interface is installed, and the Protocol option is set to STATUS4, for Receive Buffer in multi buffer mode.

Select YES to ignore the codes, and NO to process them.

3.6.5 Handling CAN/DLE

This setting determines whether the CANCEL and DATA LINK ESCAPE codes are processed or ignored.



Select YES to ignore the codes, and NO to process them. Press the **ENTER** button to confirm the setting and return to NORMAL Mode.

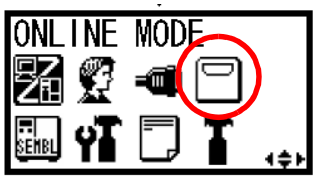
3.6.6 Other Interface Setting Options

Depending on the interface card installed on the print engine, the rest of the menus in INTERFACE mode will be specific to the type of interface card used. This is beyond the scope of this manual, but a flowchart overview of possible settings for all the optional interface cards is included at the end of this chapter. A detailed discussion of advanced settings can be found in the Service Manual available upon request.

3.7 CF CARD MODE

In this mode, you can manage any optional Compact Flash card preinstalled in the print engine at the factory.

3.7.1 Entering CF CARD Mode

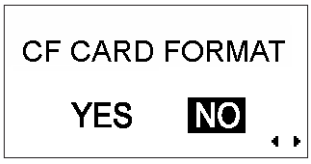


1. Press the **LINE** button to take the printer OFFLINE.

2. Press **ENTER**. The ONLINE MODE screen appears.

3. Press the ◀ ▶ ▲▼ arrow buttons until you see “CF MODE”, then press **ENTER** to perform the first setting. At any time in this mode, you can press the **FUNCTION** or **CANCEL** key to return to the main CF CARD Mode menu.

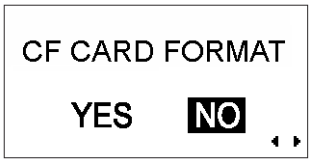
3.7.1 CF CARD Format option



1. Press the ◀ ▶ buttons to select YES or NO. The default setting is NO. Selecting YES proceeds to further menus that let you format the CF card.

2. If you selected NO, the screen returns to the main ONLINE Mode icon menu. Use the cursor buttons to select other modes for printer settings if necessary.

3. If you selected YES, the following screen appears. Press the ◀ ▶ cursor buttons to select YES or NO. Selecting NO returns the previous CF CARD FORMAT menu.

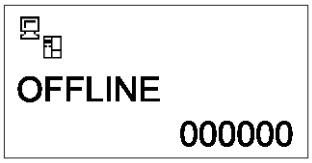


4. If you selected YES, the following screen appears. When the progress bar reaches 100 percent, the final screen appears. The CF card format has completed successfully. Press the ENTER button to return to the main ONLINE Mode menu where you can select the other modes for printer settings.

3.8 ADVANCED MODE

Advanced Mode lets you configure the more advanced features of the printer hardware.

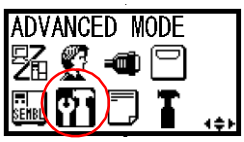
3.8.1 Entering Advanced Mode



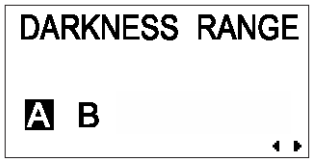
1. Press the **LINE** button to take the printer OFFLINE.

2. Press **ENTER**. The ONLINE MODE screen appears.

3. Press the ◀ ▶ ▲▼ arrow buttons until you see “ADVANCED MODE”, then press **ENTER** to perform the first setting. At any time in this mode, you can press the **FUNCTION** or **CANCEL** key to return to the Advanced Mode screen.



3.8.2 Selecting The Print Density

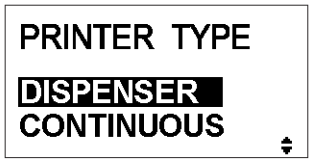


This first setting in ADVANCED MODE lets you set how dark the print quality is. Available options are from ‘A’ to ‘B’, with ‘B’ being the darkest density. The default value is ‘A’.

Adjustment of this setting is usually unnecessary. To adjust the print density, use the ◀/▶ buttons to select an option.

Press ENTER to confirm your selection and proceed to the next setting.

3.8.3 Choosing Continuous or Dispenser Operation



With this setting, you can choose between continuous paper feed or Dispenser operation. If the printer supports linerless labels, you will also see a LINERLESS option.

Press the ▲▼ buttons to select any one of the options. The default setting is DISPENSER.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.8.4 Backfeed Operation Settings

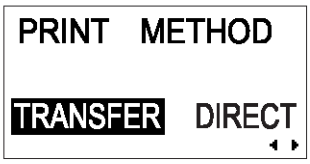
The printer can be set to apply or not apply a backfeed to the label *before* or *after* printing each label.

Press the ▲▼ buttons to choose from AFTER, BEFORE or NONE. The default setting is BEFORE.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.8.5 Setting the Print Mode

The printer can be switched to operate in Thermal Transfer or Direct Thermal mode with this setting.

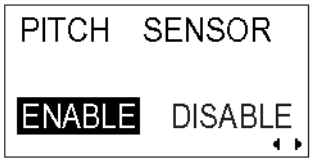


Press the ◀ / ▶ buttons to select the TRANSFER or DIRECT option. The default value is TRANSFER.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.8.6 Configuring the Pitch (paper) Sensor

The printer can be switched to operate the Pitch Sensor in Enable or Disable mode. This screen does not appear if Dispenser Operation is selected (see Section 3.8.3)

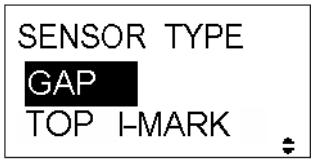


Press the ◀ / ▶ buttons to select the ENABLE or DISABLE option. The default value is ENABLE.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.8.7 Configuring the Pitch Sensor Type

This setting specifies which pitch sensor (also called paper sensor) is to be used: Gap sensor (penetration sensor), sensor for Top I-mark (if this optional sensor is installed), and normal bottom I-Mark sensor.



Press the ◀ / ▶ buttons to select between I-Mark or GAP settings. The default value is GAP.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

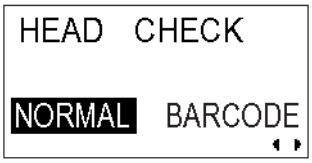
3.8.8 Turning Head Check Function ON/OFF

The printer can be set to perform a check of the print head when printing each label.

Press the ◀ / ▶ buttons to select the ENABLE or DISABLE option. The default value is ENABLE.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.8.9 Choosing the Type of Head Check



If Head Check has been enabled, you will see this screen. Here, you can specify the print head checking to be performed unconditionally, or only when barcodes are being printed.

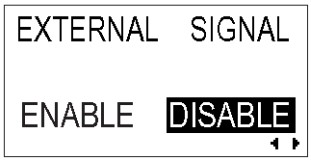
Press the ◀ / ▶ buttons to select the NORMAL or BARCODE option. The default option is NORMAL.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

About the Head Check function

- The head check function detects the integrity of the heating elements in the thermal print head. However, malfunctions cannot be detected instantaneously—a few printed labels may start showing printing defects before the printer warns of a print head error.
- After detection of a print head error, use a scanner to check all affected labels.
- When a head check error occurs during normal printing (barcodes, text and graphics), press and hold down the **FEED** button for five seconds. At the next screen, select NORMAL and then press and hold down the **LINE** and **FEED** buttons for five seconds to cause printing to resume. If the head check error occurs again, set the type of head check to BARCODE and see if printing can be resumed normally.
- Although restricting the head check type to BARCODE allows you to continue printing, you should only do so in order to complete an urgent print job. Check the printed labels to make sure the output is usable in spite of the head error. As soon as possible, stop using the print head to prevent further damage. If necessary, get the print head replaced.

3.8.10 Enabling/Disabling External Signal Output

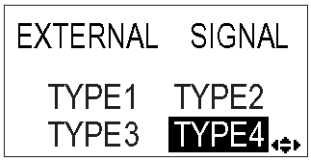


Set this option to enable or disable the printer's external signal communication port. If the port is enabled, you can send and receive data using an appropriate device plugged into the EXT port.

Press the ◀ / ▶ buttons to select the ENABLE or DISABLE option. The default value is DISABLE.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.8.11 Selecting the Type of External Signal Output

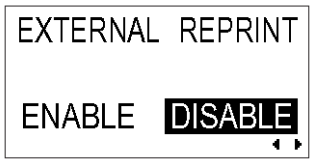


If the External Signal Output option is enabled, you will be brought to this screen to select the type of PREND output signal.

Press the ◀/▶ ▲▼ buttons to select TYPE1, TYPE2, TYPE3 or TYPE4. The default value is TYPE4. For more details, refer to the SBPL Programming Guide found in the accessory CD-ROM.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.8.12 Selecting Reprint via External Signal Output

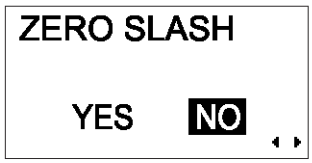


If the External Signal Output option is enabled, you will be brought to this screen to choose whether the Reprint function can be activated via the external signal port.

Press the ◀/▶ buttons to select ENABLE or DISABLE. The default setting is DISABLE.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.8.13 Setting Zero Slash Changeover

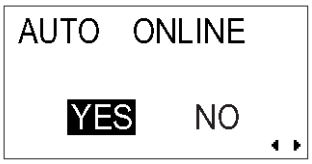


You can use this setting to determine whether zeroes are printed with a slash across them or not. The zero slash (excluding Kanji) can be set to either "0" or "Ø".

Use the ◀/▶ buttons to select YES or NO. ‘YES’ means zeroes will be printed with a diagonal slash across them. ‘NO’ means otherwise. The default value is ‘YES’.

Press ENTER to select the desired option and proceed to the next setting.

3.8.14 Using the Auto Online Feature

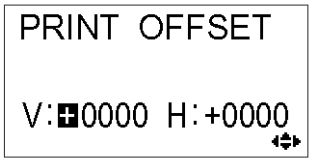


The printer can be set to go into ONLINE mode automatically upon being turned on. Otherwise, the printer starts in the OFFLINE state.

Press the ◀ / ▶ buttons to select YES or NO. The default setting is YES.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.8.15 Setting Print Offset



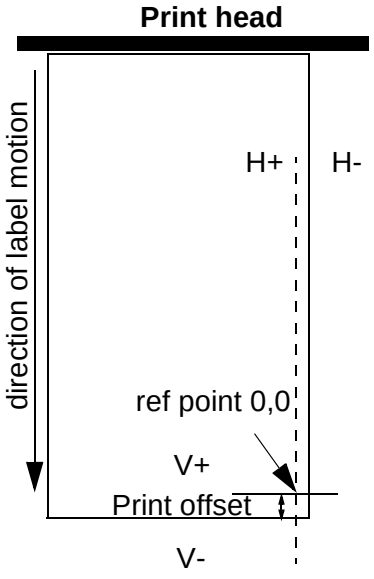
The next screen allows you to set the Print Position Offset—which refers to the vertical and horizontal shifting of the entire print area, relative to the start position of printing (V=0, H=0), defined by default to be the bottom right hand corner of the label.

Use the ◀ / ▶ buttons to select the V or H setting, and the ▲/▼ buttons to change a highlighted setting. Press the **ENTER** button to confirm a setting and proceed to the next screen.

The V setting is for the Vertical print offset. A positive (+) offset means the printing is shifted towards the print head; a negative (-) offset means shifting away from the print head. If the Print Pitch setting has been used to offset the vertical start position, then all Vertical offset adjustments are made relative to that start position.

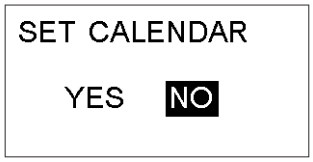
The H setting is for the Horizontal print offset. The + or - prefix determines whether the offset is to the left or to the right of the reference point.

Model	Valid H and V settings (in dots)
S8408	V: +/- 000 to 1424 dots, H: +/- 000 to 832 dots
S8412	V: +/- 000 to 2136 dots, H: +/- 000 to 1248 dots
S8424	V: +/- 000 to 4272 dots, H: +/- 000 to 2496 dots



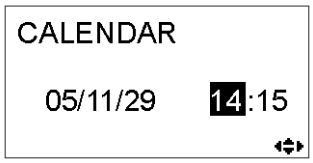
After setting the Vertical and Horizontal OFFSET, press ENTER to proceed to the next setting.

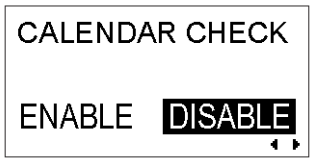
3.8.16 Setting the Calendar



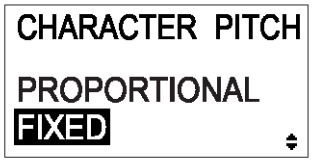
This menu lets you set the desired data and time if necessary.

Press the ◀ / ▶ buttons to select YES or NO.
Select NO to skip to the Zero Slash setting screen. Select YES to set the date and time using the Press the ◀ / ▶ ▲▼ buttons. Thereafter, the next screen lets you ENABLE or DISABLE the Calendar Check function. Choose the appropriate option and press the **ENTER** button leave the Calendar settings and proceed to the next screen.





3.8.17 Setting Proportional Pitch



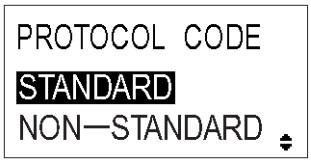
This setting determines whether the space surrounding each text character is of a fixed width, or whether that space is to be varied to be visually more pleasant.

Use the ▲▼ buttons to select either PROPORTIONAL or FIXED. The default value is PROPORTIONAL.

Press ENTER to confirm your selection and return to the main User Mode screen. Press the **FUNCTION** or **CANCEL** key to exit the User Mode setting.

Note:
The subject fonts are from x21 to x24

3.8.18 Specifying the Protocol Code Format

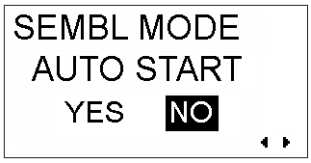


The ESC sequence can be defined as standard (using non-printable code 1BH) or non-standard (some other user code).

Press the ◀ / ▶ buttons to select the STANDARD or NON-STANDARD option. The default setting is STANDARD.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.8.19 Specifying SEMBL AUTO START



Note:
SEMBL requires the optional CF Card to be installed. SEMBL programs are stored on the CF Card.

This setting determines if the printer enters SEMBL mode automatically on being turned ON. The available options are YES and NO.

Press the ◀ / ▶ buttons to select YES or NO. The default setting is NO. Selecting NO takes you to the RIBBON SAVER option below.

If YES is selected, you will see the next screen, which lets you choose from the BASIC programs found in the printer's memory. Use the cursor buttons to select from the list of available programs. Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.8.20 Setting the Ribbon Saver feature

This setting enables or disables the Ribbon Saver feature. This feature detects blank parts of a label while printing, and stops the ribbon from winding until there is data to be printed.

Press the ◀ / ▶ buttons to select ENABLE or DISABLE. The default setting is ENABLE.

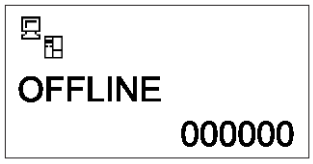
Press the **ENTER** button to confirm the setting and return to the ONLINE mode icon menu.

3.9 HEX DUMP MODE

3.9.1 Entering HEX Dump Mode

1. Press the **LINE** button to take the printer OFFLINE.

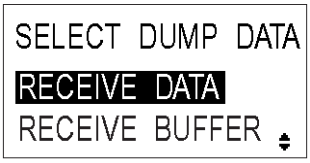
2. Press **ENTER**. The ONLINE MODE screen appears.



3. Press the ◀ ▶ ▲▼ arrow buttons until you see words “HEX DUMP MODE”, then press **ENTER** to perform the first setting. At any time within this mode, pressing **CANCEL** takes you back one screen. Pressing the **FUNCTION** button returns you immediately to the main Hex Dump screen.

3.9.2 Selecting Data To Dump

Here you can choose to dump either incoming data (receive data) or print data already stored in the buffer (receive buffer) .

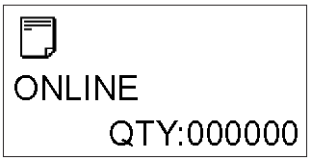


Press the ▲▼ buttons to choose RECEIVE DATA, RECEIVE BUFFER or INTERNAL DATA. Note that RECEIVE BUFFER cannot be selected when there is no received data. The INTERNAL DATA option refers to data stored in the printer buffer.

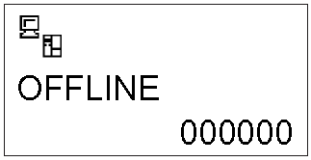
Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.9.3 Controlling the Hex Dump Mode

During the HEX Dump, the following screen appears. The number of labels printed will be shown. When printing is done, press the **LINE** button to take the printer OFFLINE. Then press **ENTER** to return to the main HEX DUMP Mode screen.

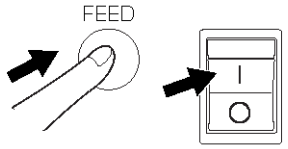


If you dumping the RECEIVE BUFFER, take the printer OFFLINE to stop any incoming data from affecting the buffer. Only then can the buffered data be printed. The printer goes ONLINE automatically after the printing.



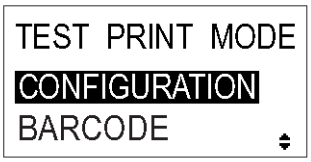
3.10 TEST PRINT MODE

3.10.1 Entering Test Print Mode



1. Make sure the printer is turned OFF.

2. Press and hold down the **FEED** button while turning the printer ON. The display will show TEST PRINT MODE.



3. Press the ▲▼ buttons to choose from six options, as explained in the next sub-section.

At any time within this mode, pressing **CANCEL** takes you back one screen. Pressing the **FUNCTION** button returns you immediately to the main Test Print screen.

3.10.2 Choosing What The Test Print Contains

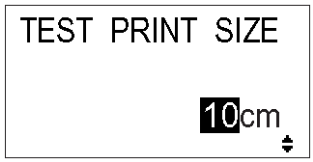
The six settings in this mode are as follows:

CONFIGURATION	The configuration settings of the printer will be printed.
BARCODE	The barcodes installed in this printer will be printed.
HEAD CHECK	The head check pattern of the selected paper size area will be printed.
FONT	The contents of the fonts installed in this printer will be printed.
FACTORY	The factory test print will be performed.

Press the ▲▼ buttons to choose any option to set the test print contents.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

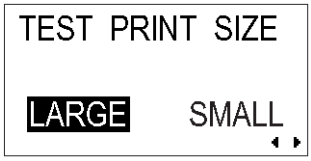
3.10.3 Setting Test Print Options



If you chose test prints of Configuration, Barcode and Head Check in the previous menu, this screen lets you choose the width of the test print from “04” to “10” cm, in increments of 1 cm,

Press the ▲▼ buttons to choose the print size. Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.10.4 Setting the Size of the Factory Test Print



For Factory test prints, this screen appears instead of the previous screen for setting print size. In this screen, you can choose only to print the test results in LARGE or SMALL print widths. The LARGE setting results in a 10 cm print width. The SMALL setting results in a 4 cm print width.

⚠ Caution

If you are using narrow labels, do NOT set this option to LARGE; otherwise, this may damage the print head.

Press the ◀ ▶ buttons to choose LARGE or SMALL. Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.10.5 Starting the Test Print

When you are ready to print out the test data, press the **ENTER** button. The test print will start, and it will cycle continuously.

During printing, the **ENTER** button can be used to suspend and resume the test printing.

To exit the Test Print mode, turn off the printer.

3.11 SERVICE MODE

3.11.1 Entering Service Mode

1. Press the **LINE** button to take the printer OFFLINE.

2. Press **ENTER**. The ONLINE MODE screen appears.

3. Press the ◀ ▶ ▲▼ arrow buttons until you see words "SERVICE MODE", then press **ENTER** to perform the first setting. At any time within this mode, pressing **CANCEL** takes you back one screen. Pressing the **FUNCTION** button returns you immediately to the main SERVICE MODE screen.

3.11.2 Selecting the I-Mark Sensor Level Offset

Here you can calibrate the I-Mark sensor level offset. This offset can be used to adjust how soon the sensor responds to an oncoming I-mark. A setting of 1 to 99 is possible. The default value is 50.

Press the ▲▼ buttons to choose change the offset value.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.3 Selecting the I-Mark Sensor Slice Level

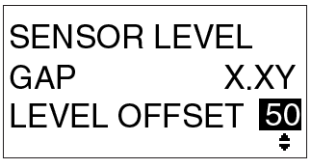
Here you can calibrate the I-Mark sensor slice level. This level is used to adjust the sensitivity to media of different reflectivity. A setting of 0.0 to 3.2 V is possible. The default value is 1.4 V. Setting the level to 0.0 V causes the slice level to be determined by the printer automatically.

Press the ▲▼ buttons to choose change the slice level.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.4 Selecting the Gap Sensor Level Offset

Here you can calibrate the Gap sensor level offset. This offset can be used to adjust how soon the sensor responds to an oncoming gap. A setting of 1 to 99 is possible. The default value is 50.

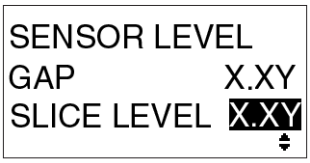


Press the ▲▼ buttons to choose change the offset value.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.5 Selecting the Gap Sensor Slice Level

Here you can calibrate the Gap sensor slice level. This level is used to adjust the sensitivity to media of different transparency. A setting of 0.0 to 3.2 V is possible. The default value is 1.2 V. Setting the level to 0.0 V causes the slice level to be determined by the printer automatically.



Press the ▲▼ buttons to choose change the slice level.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.6 Setting the Auto Online Feed

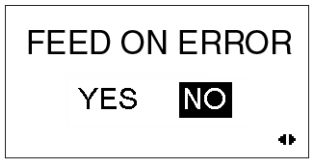
Here you can set the printer to issue a single FEED to any loaded or partially loaded label whenever the printer is turned ON and goes into the ONLINE status. This is by selecting the YES option. Selecting NO will result in no automatic label feed when the printer is turned ON. The default setting is NO.

Press the ◀▶ buttons to choose the desired option.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.7 Setting the Feed on Error feature

This feature causes the printer to issue a label whenever the it returns to an ONLINE status after any error has been fixed, or whenever the printer is turned ON. This is set by selecting the YES option. Selecting NO will result in no automatic label feed for the same conditions. The default setting is NO.



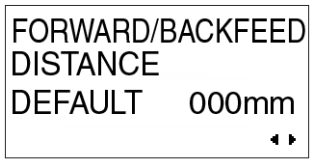
Press the ◀ ▶ buttons to choose the desired option.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.8 Setting the Forward/Backward Feed Distance

The Forward/Backward Feed Distance setting determines how much a label is wound forward or backward in addition to the OFFSET potentiometer under the Operational Panel.

The default setting uses fixed values set at the factory. If these values are unsuitable, press the ◀ ▶ buttons to choose the three digit value. Use the ▲ ▼ buttons to change the value from 001 to 255 mm.



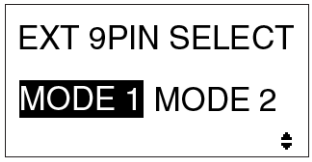
Press the **ENTER** button to confirm the setting and proceed to the next screen.

Note: *For thermal transfer printing, set the feed distance under 30mm to avoid accidental detection of ribbon end.*

3.11.9 Setting the EXT Port Status Signal

The built-in 9-pin EXT port can be set to issue a status signal for two different modes of printer operations. MODE1 specifies that the port outputs a signal to indicate whether the printer has any labels queued up for printing. MODE2 specifies that the port outputs a signal to indicate whether the printer is ONLINE or OFFLINE.

The default setting is MODE1. Press the ◀ ▶ buttons to choose MODE2 if desired.



Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.10 Setting the Backfeed Speed

This function provides a stronger pulling force when a bigger and heavier supply of label roll is being used. The default value is FAST, which selects a normal pulling force and gives better throughput. Select NORMAL if a stronger pulling force is required.

Note:
The FAST option can be used safely as long as there is an adequate label feeding system (add some mechanism between the engine and label roll so that the printer does not require a very strong pulling force for the label roll in use.)

Press the ◀ ▶ buttons to choose the NORMAL setting if desired.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.11 Setting the Symbol for the Euro currency

This menu lets you select the symbol for representing the Euro mark.

The default value is D5. Press the ▲ ▼ buttons to choose another value if desired.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.13 Enabling or Disabling the Display Priority for System Commands

This menu lets you enable or disable the display of certain system commands such as Print Darkness, Print Speed, Start Point Correction, Printer Type, Print Method and Sensor Type.

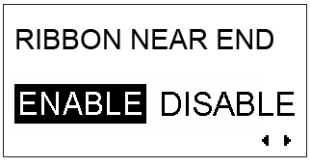
The default setting is COMMAND, where all system commands are displayed in the LCD menus when applicable. Press the ◀ ▶ buttons to choose INTERNAL if you wish to disable the display of the system commands.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.14 Enabling or Disabling the Ribbon Near End Warning

This menu lets you enable or disable the re-detection of the label pitch whenever the printer is turned OFF and then ON again, with the print head unlatched.

The default setting is ENABLE, where the printer will re-detect the label pitch. Press the ◀ ▶ buttons to choose DISABLE if you wish to disable the sensing of a ribbon roll nearing the end of its supply.



Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.14 Enabling or Disabling the Label Pitch Re-Detection

This menu lets you enable or disable the re-detection of the label pitch whenever the printer is turned OFF and ON with the print head unlatched.

The default setting is ENABLE, where the printer will re-detect the label pitch. Press the ◀ ▶ buttons to choose DISABLE if you wish to disable the sensing of a ribbon roll nearing the end of its supply.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.15 Assigning the Function Button

This menu lets you assign a function to the Function button. The NONE setting disables the button. You can also choose to make the Function button issue a REPRINT command or use it to switch to SEMBL MODE.

The default setting is NONE. Press the ▲ ▼ buttons to choose REPRINT or SEMBL MODE if desired.

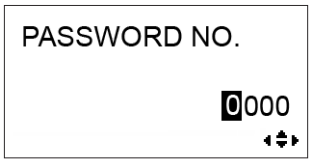
Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.16 Setting the Password Feature

This menu lets turn the password security ON or OFF when a user tries to switch between the User Mode, Interface Mode, CF Card Mode, Advanced Mode, HEX Dump Mode and Service Mode.

The default setting is OFF. Press the ◀ ▶ buttons to choose ON if desired. In this case, the next menu would prompt for a four digit number as the password. Press the ▲▼ and ◀ ▶ buttons to change any digit to define the desired password.

Press the **ENTER** button to confirm the setting and proceed to the next screen.



3.11.17 Setting the Compatibility Mode

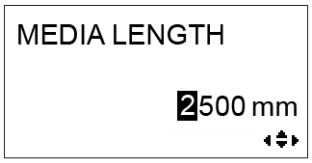
This menu lets you turn the Compatibility Mode ON. When Compatibility Mode is ON, the functions and settings that are unique to the S84xx series will be disabled or modified to match the characteristics of older SATO printers of the same family. This allows legacy or custom-programmed labeling software to run on this printer without requiring modification.

The default setting is OFF. Press the ◀ ▶ buttons to choose ON if desired.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.17 Setting the Media Length

This menu appears if Compatible Mode has been turned OFF. It lets you define the maximum length of label used. The default value varies depending on head density: .



[8dot/mm] 0 to 2500 mm
[12dot/mm] 0 to 1500 mm
[24dot/mm] 0 to 400 mm

Press the ▲▼ and ◀ ▶ buttons to choose the digits to change.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

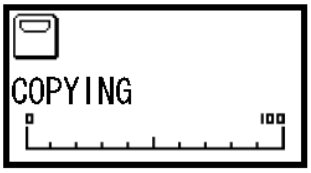
3.11.18 Copying Firmware Data

This menu can be used to start the process of copying Firmware data to and from the ROM and CF Card (optional). The default setting is NO, meaning that no copying is required.

Press the ◀ ▶ buttons to choose YES if you wish to start the process of copying firmware data.

If your selection is NO, press the **ENTER** button to confirm the setting and proceed to the next screen. Otherwise, a further menu appears, letting you select copying from the CF CARD->ROM or ROM->CF Card. The default is CF CARD->ROM. Select the required mode of transfer and press **ENTER**.

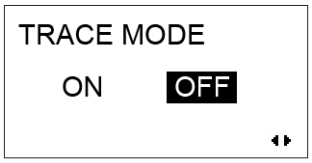
The COPY START menu appears, confirming either the CF CARD->ROM or ROM->CF CARD operation you selected. Press the ◀ ▶ buttons to choose YES to start the copy operation. Or choose NO to return to the previous menu.



During the copying process, a status menu appears, When the horizontal bar reaches 100, the copy process is complete.

3.11.19 Setting the TRACE Mode

This menu appears lets you turn TRACE MODE ON or OFF. When turned ON, TRACE MODE causes the LCD to display three different icons to trace the processing of a label.



(1) Data reception…Displayed after receiving data
(2) Edit data……..Displayed after receiving ESC(1BH) A
(3) Print……..Displayed after a printing operation

Press the ◀ ▶ buttons to choose ON or OFF.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.20 Saving the Print Log

This menu appears lets you ENABLE or DISABLE the print log feature. This feature saves a log of print jobs to the optional CompactFlash card installed in the printer. Turn it OFF if you do not wish to have the print log saved to the CF Card. The default setting is DISABLE.

Press the ◀ ▶ buttons to choose ENABLE or DISABLE.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.21 Clearing the Print Log

This menu appears lets you clear any print log saved to the CF Card. The default setting is NO.

Press the ◀ ▶ buttons to choose YES or NO.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.11.22 Setting the Print Log to Output at the Subport

With this option, you can output the print log to the printer's Subport. The Subport refers to the topmost card slot at the rear of the printer. Installing an interface card in this slot provides a Subport. The default setting is DISABLE.

Press the ◀ ▶ buttons to choose YES or NO.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

Note:
By default the mini-slot I/F card is set to be a subport for status monitoring purposes only. The main I/F card is by default the data port for printing purposes. However, you can exchange the roles of the two slots using the Data Port Assignment setting. See "3.6.3 Data Port Assignment" on page 3-11.

3.12 BOOT DOWNLOAD MODE

3.12.1 Entering Boot Download Mode

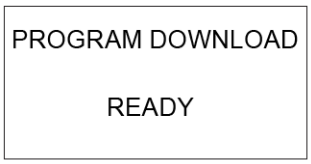
1. Press the **FUNCTION, ENTER** and Down-Arrow (▼) buttons when turning the printer ON. The screen shows the Boot Downloader menu with two choices: INTERFACE and CF CARD. The default setting is INTERFACE.

2. Press the ▲ ▼ arrow buttons to choose INTERFACE or CF CARD (if the optional CF CARD is installed).

3. If you selected INTERFACE, the following menu appears. I/F-2 refers to the optional Subport provided by a USB interface card that can be purchased separately.

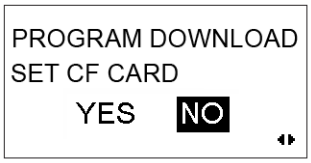
   I/F-1 is the normal built-in 14-pin EXT port (or optional 25-pin EXT port). The default setting is I/F-2.

   Press the ▲ ▼ arrow buttons to choose one of the ports, then press ENTER to proceed.



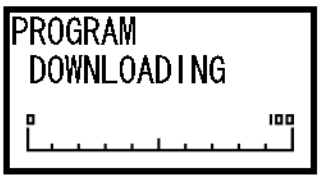
4. When the printer is ready to start downloading, the following screen appears, and you can initiate the data transfer from the host.

5. If you selected CF CARD in Step 2, the following menu appears. It prompts you to confirm that the optional CF CARD is already installed and set up for use.

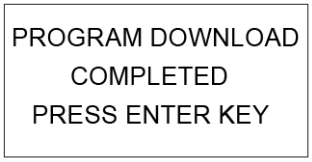


   Press the ◀ ▶ buttons to choose YES or NO. Choosing NO returns you to the previous menu. Choosing YES proceeds to the download progress screen.

6. After the host system starts the data transfer, the following progress screen appears. The downloading process is complete when the black horizontal progress bar reaches 100.



7. When the data has been completely transferred, the final confirmation screen appears as shown, prompting you to press **ENTER** to continue.



3.13 SIMPLE STANDALONE MODE

This is a special mode for advanced users or operators, and requires the CF Card option to be installed. Simple Standalone Mode allows the operator to store the most recently printed label data to be stored onto the CF Card. From then on, the operator can reprint as many copies of that stored label without needing a host computer to re-send the data. The feature is similar to the Reprint function (see 3.11.15 Assigning the Function Button), except that the label data is non volatile. The Reprint function loses all reprint data once the printer has been turned OFF.

3.13.1 Entering Simple Standalone Mode

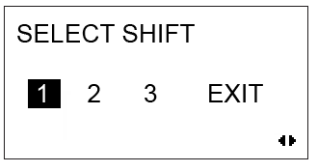
Note:
Make sure the CF Card is installed properly in the printer. Send the print job to be stored to the printer to print at least one label before entering the Simple Standalone Mode to store the label data.

1. After sending a single print job consisting of a single label, press the Up-Arrow (▲) button and hold it for five seconds. The following menu appears.
2. Press the ◀ ▶ arrow buttons to select YES (to save the label data onto the CF CARD) or NO to exit the mode. The default setting is NO.
3. If you selected YES, this next screen lets you determine the number of labels to be reprinted from the stored label data. Press the ▲▼ and ◀ ▶ buttons to choose the digits to change. The printer returns to the OFFLINE status.
4. Press the **LINE** button to start the reprinting process.

3.14 WORKSHIFT MODE

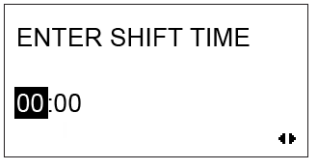
This is a special mode for advanced users or operators. Use this mode to store factory shift periods so that this data can be printed along with label data to identify which factory staff generated any particular label. Such data is useful for accountability tracking or troubleshooting.

3.14.1 Entering Workshift Mode



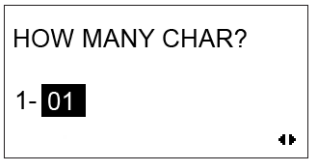
Note:
The Shift Code option in Hidden Mode (accessible when turning the printer ON with the ◀ ▶ and ▲ arrow buttons held down) must be enabled to allow the Workshift Mode.

1. In ONLINE mode, press the **LINE** and **FEED** buttons for 10 seconds until the following menu appears.

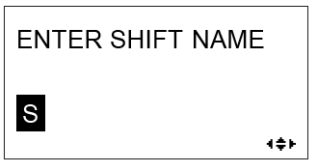


2. Press the ◀ ▶ arrow buttons to select one of the three shifts to define its parameters. The default is shift 1. Press ENTER.

3. If you selected YES, this next screen lets you define the time of the selected shift. Press the ◀ ▶ buttons to choose the digits to change. Press ENTER when this has been completed.



4. In the next screen, the selected shift number is displayed, followed by a prompt to enter the number of characters for the name of the selected shift. Use the cursor buttons to choose any number from 1 to 16. Press ENTER to continue.



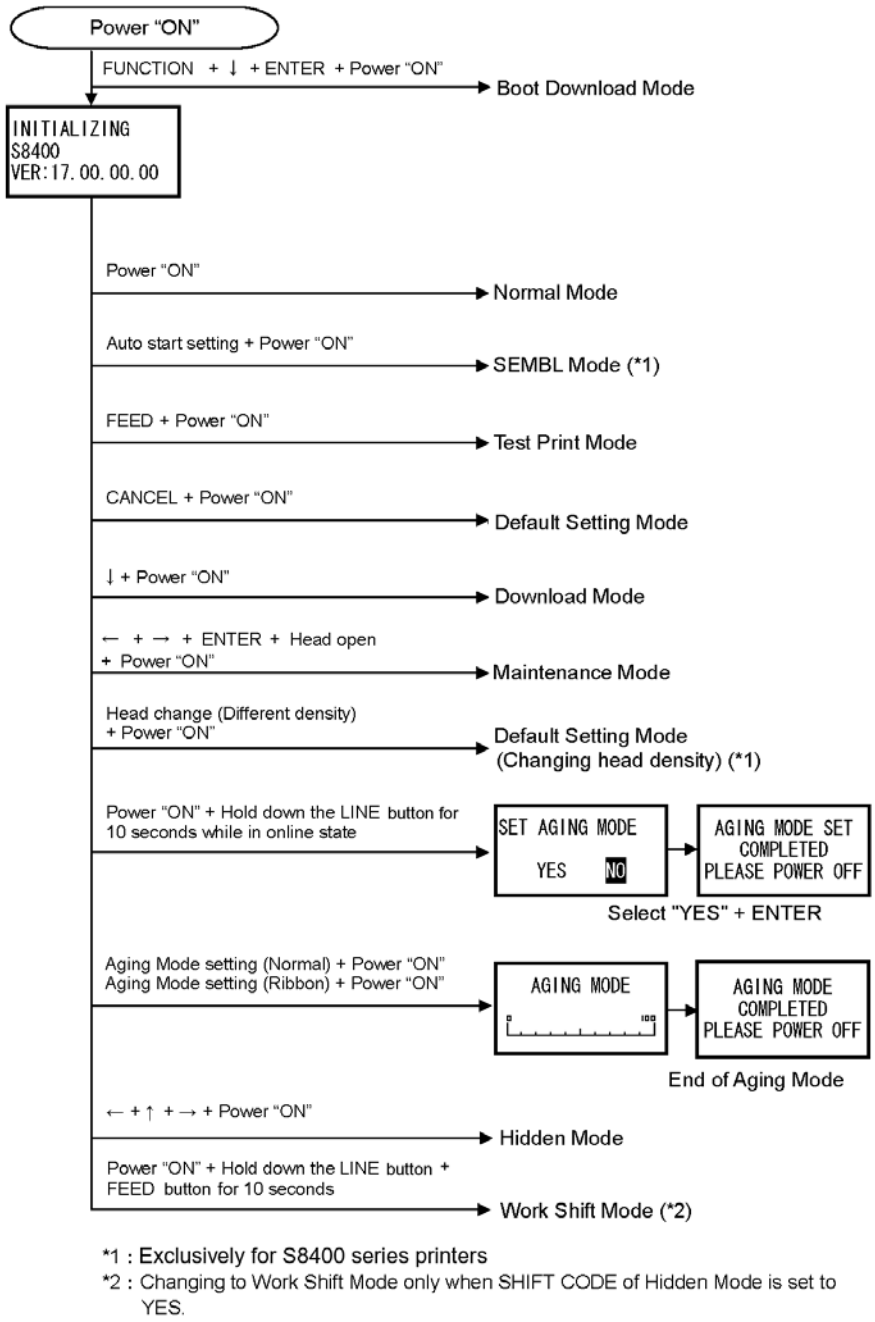
5. In the final menu, use the ▲▼ and ◀ ▶ buttons to define an alphanumeric name for the selected shift. Press ENTER when done.

6. Repeat the above procedure for all the other shifts if necessary.

7. The shift time and name can be appended to any print job with the proper commands in a print job. Please refer to the Programming Manual for the necessary commands to access the defined shift information.

3.15 OVERVIEW OF ALL MODES

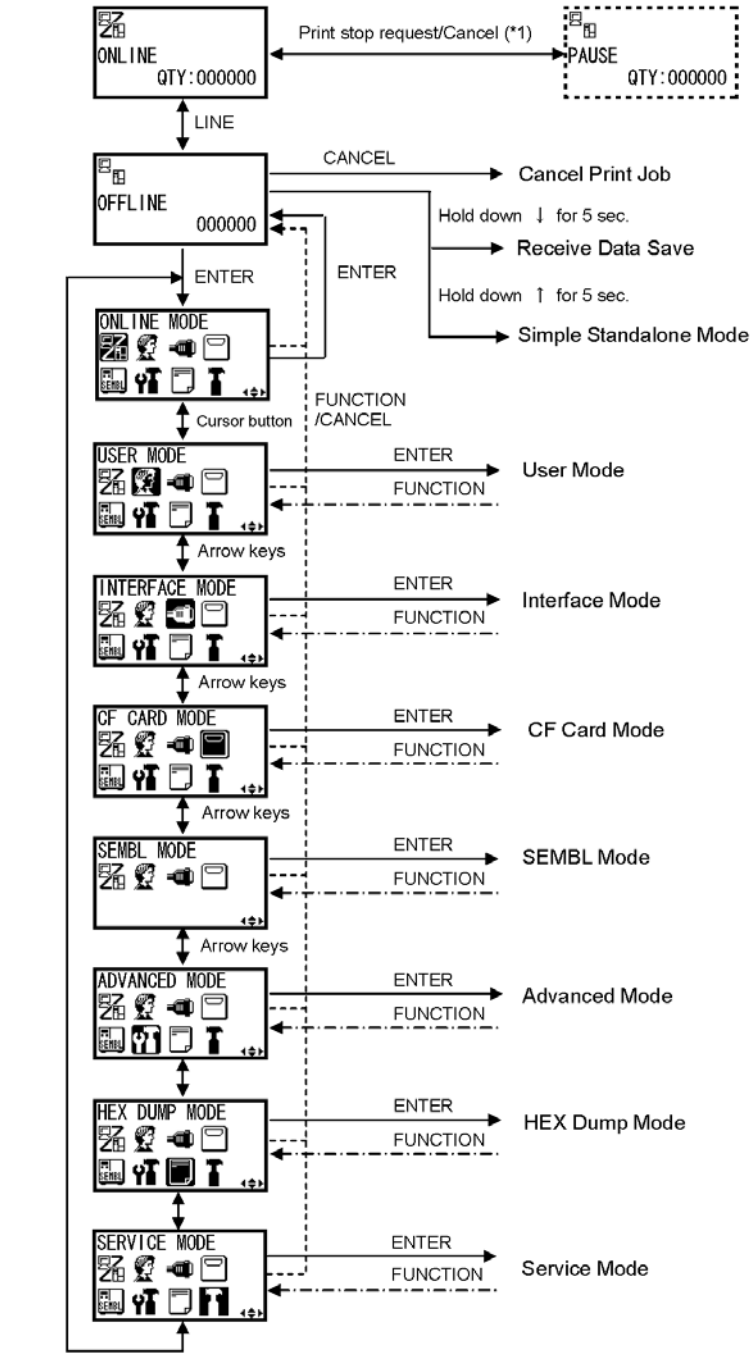
Note: Some modes listed in these detailed flowcharts are Reserved for qualified service engineers only. These modes are described fully in the Service Manual available upon request.


Power "ON"
FUNCTION + ↓ + ENTER + Power "ON"
Boot Download Mode
INITIALIZING
S8400
VER:17.00.00.00
Power "ON"
Normal Mode
Auto start setting + Power "ON"
SEMBL Mode (*1)
FEED + Power "ON"
Test Print Mode
CANCEL + Power "ON"
Default Setting Mode
↓ + Power "ON"
Download Mode
← + → + ENTER + Head open + Power "ON"
Maintenance Mode
Head change (Different density) + Power "ON"
Default Setting Mode (Changing head density) (*1)
Power "ON" + Hold down the LINE button for 10 seconds while in online state
SET AGING MODE
YES NO
AGING MODE SET COMPLETED PLEASE POWER OFF
Select "YES" + ENTER
Aging Mode setting (Normal) + Power "ON"
Aging Mode setting (Ribbon) + Power "ON"
AGING MODE
AGING MODE COMPLETED PLEASE POWER OFF
End of Aging Mode
← + ↑ + → + Power "ON"
Hidden Mode
Power "ON" + Hold down the LINE button + FEED button for 10 seconds
Work Shift Mode (*2)

*1 : Exclusively for S8400 series printers
*2 : Changing to Work Shift Mode only when SHIFT CODE of Hidden Mode is set to YES.

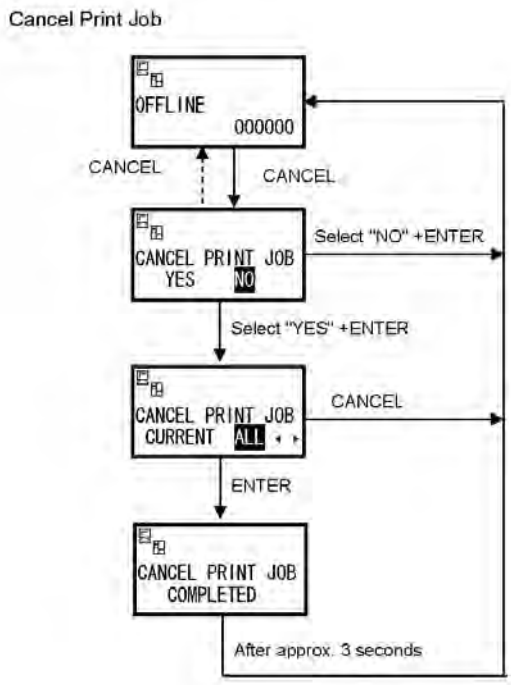
3.15 OVERVIEW OF ALL MODES (CONT'D)

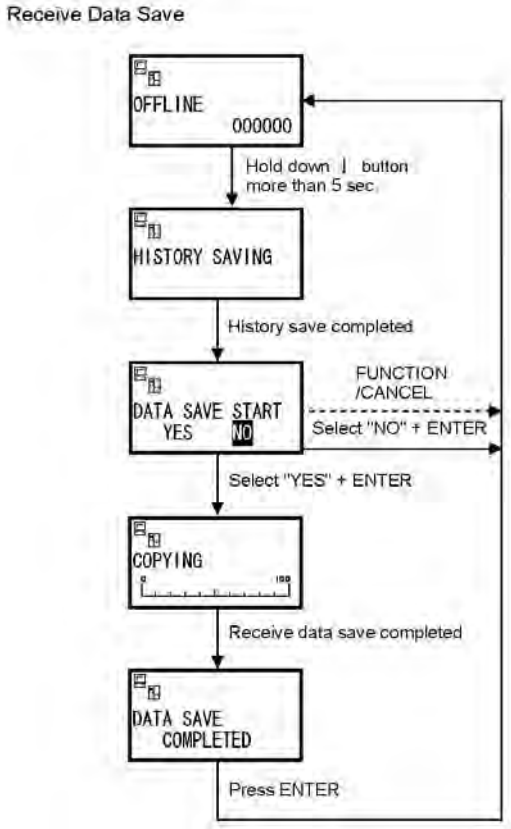
Normal Mode



*1: Print stop request/Cancel is available for STATUS4 and STATUS5 only.

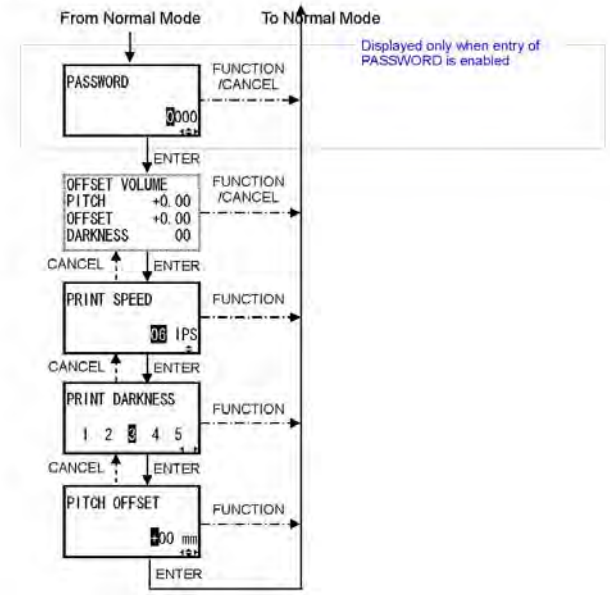
3.15 OVERVIEW OF ALL MODES (CONT'D)



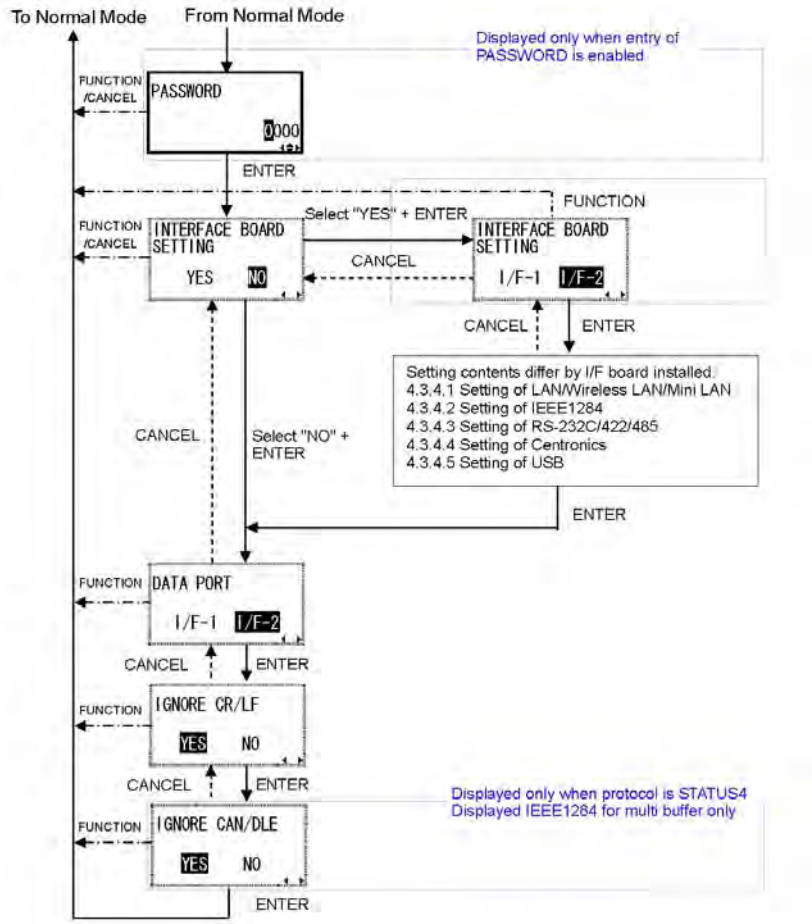


3.15 OVERVIEW OF ALL MODES (CONT'D)

User Mode



Interface Mode



3.15 OVERVIEW OF INTERFACE MODE CONFIGURATIONS

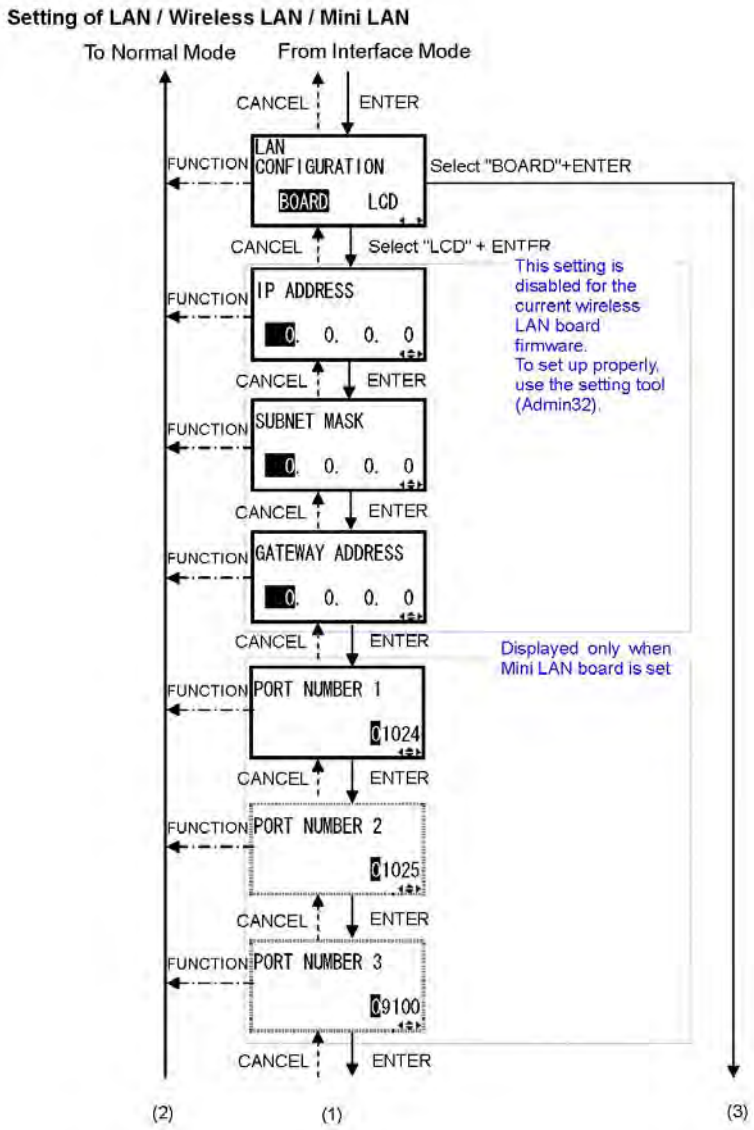


Chart continued on next page►

3.15 OVERVIEW OF INTERFACE MODE CONFIGURATIONS (CONT'D)

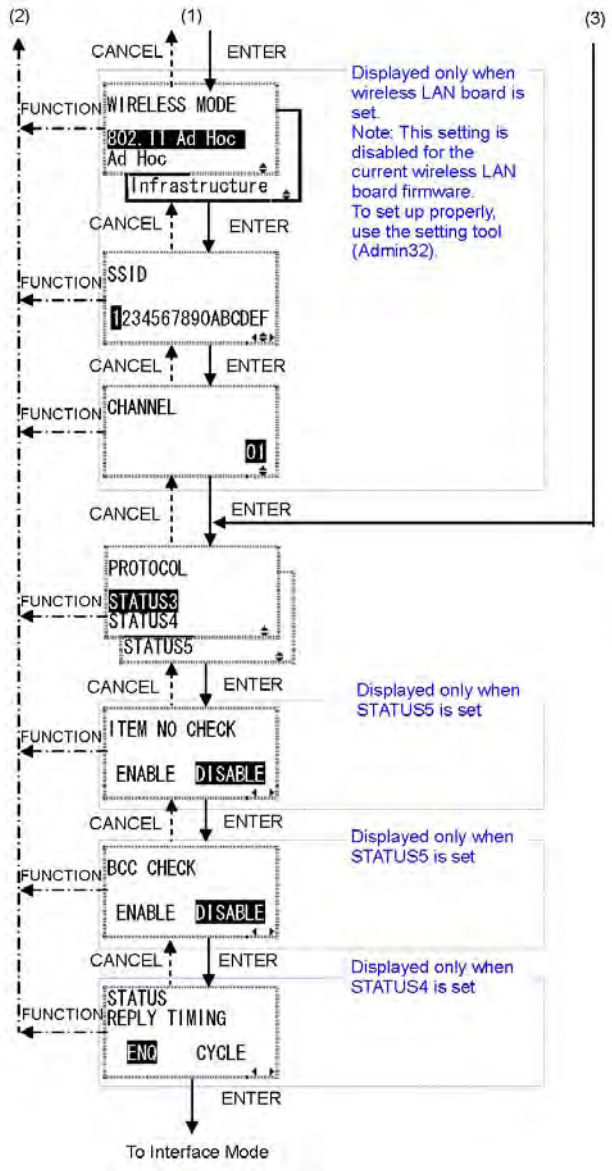


Chart continued on next page►

3.15 OVERVIEW OF INTERFACE MODE CONFIGURATIONS (CONT'D)

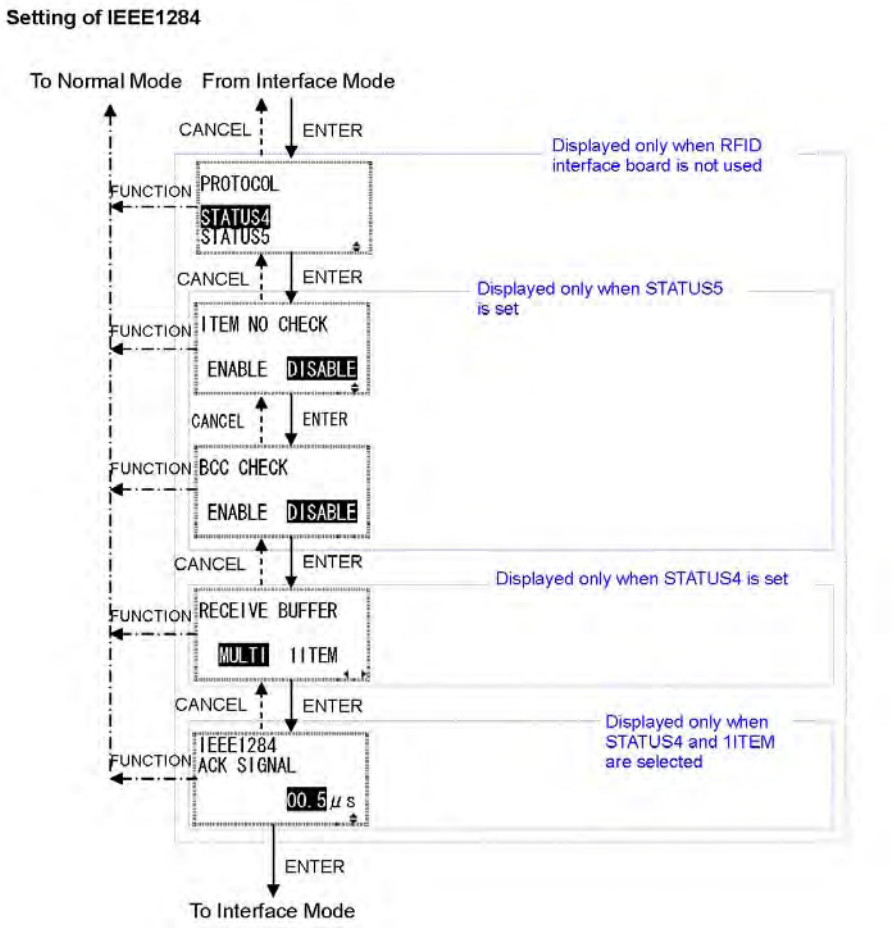


Chart continued on next page

3.15 OVERVIEW OF INTERFACE MODE CONFIGURATIONS (CONT'D)

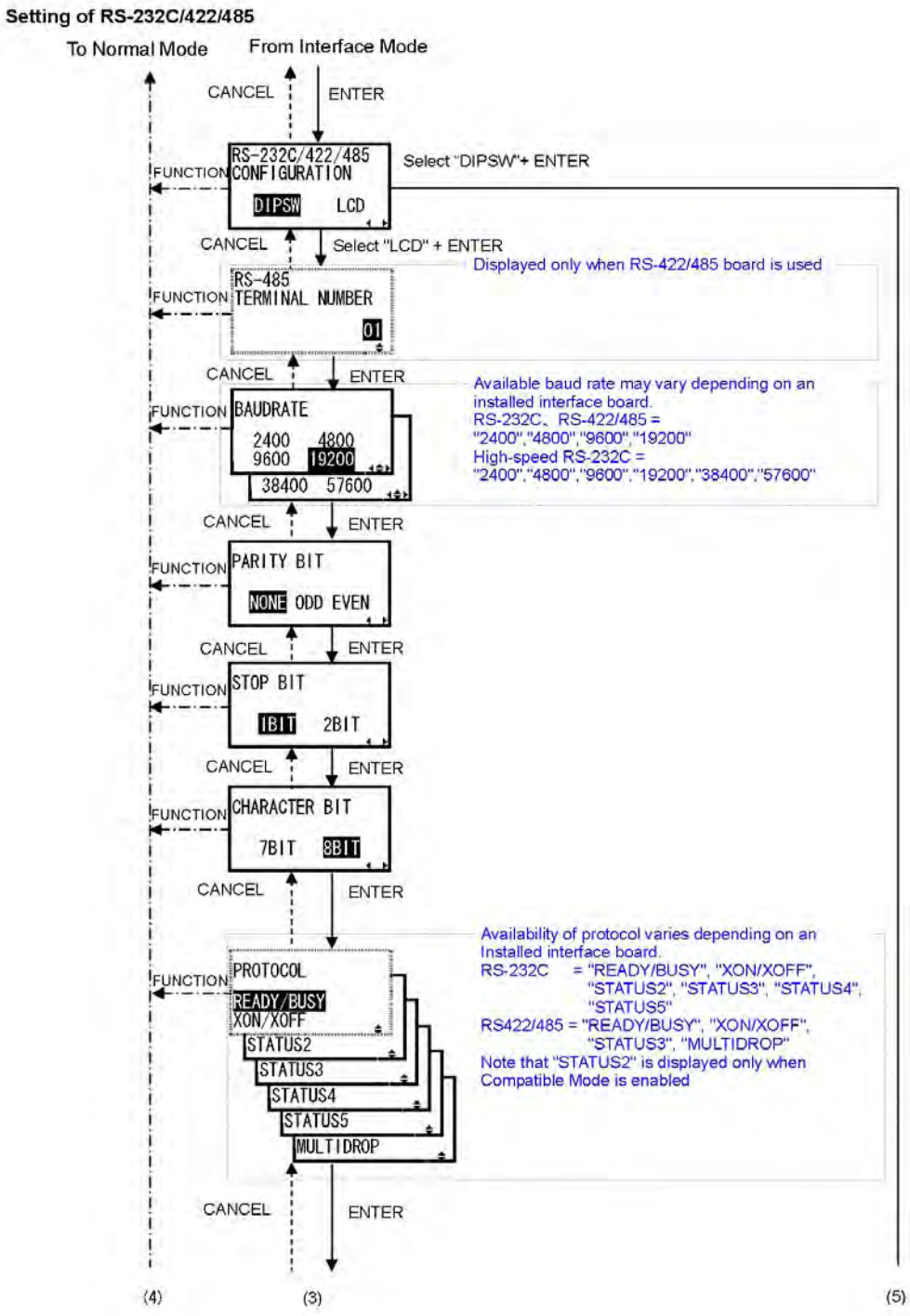
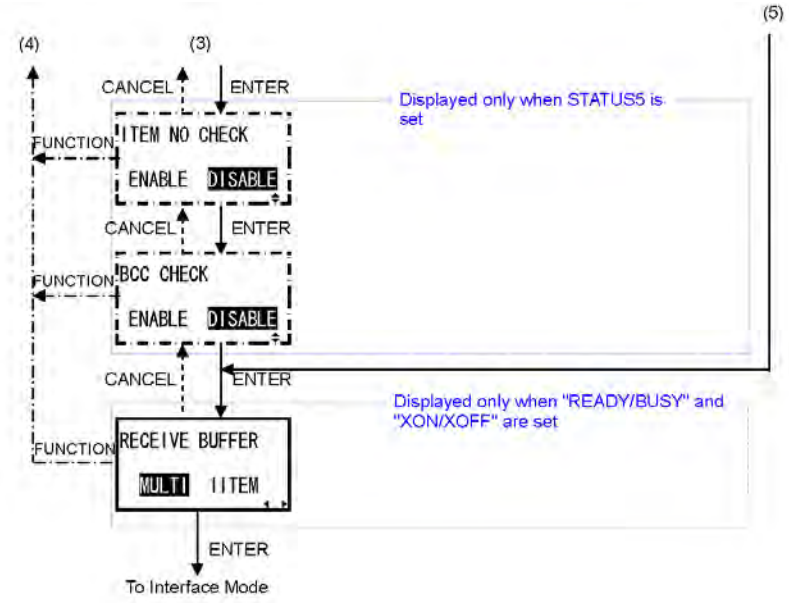
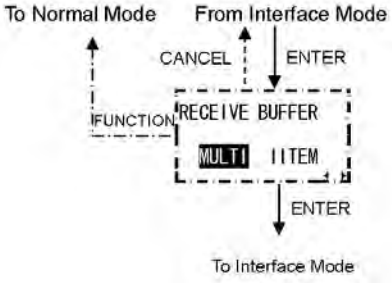


Chart continued on next page►

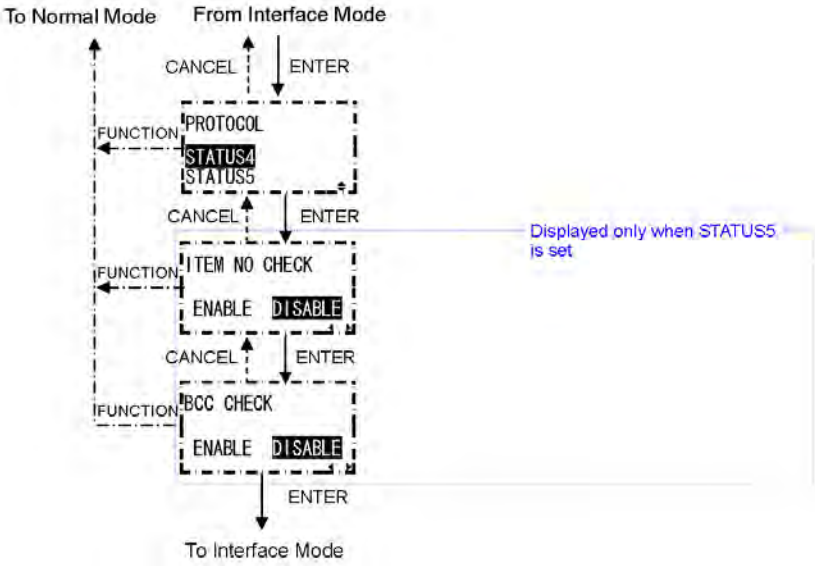
3.15 OVERVIEW OF INTERFACE MODE CONFIGURATIONS (CONT'D)



Setting of Centronics

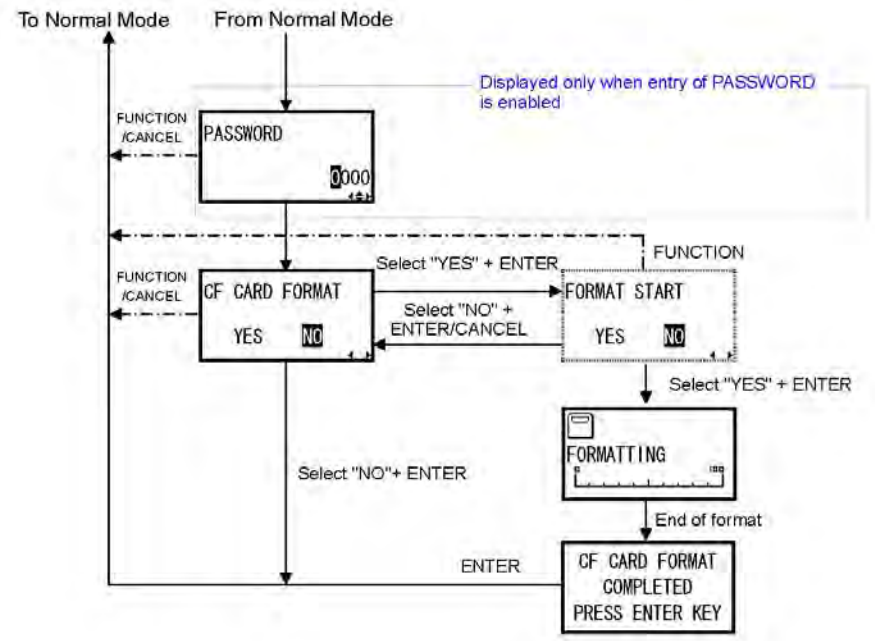


Setting of USB

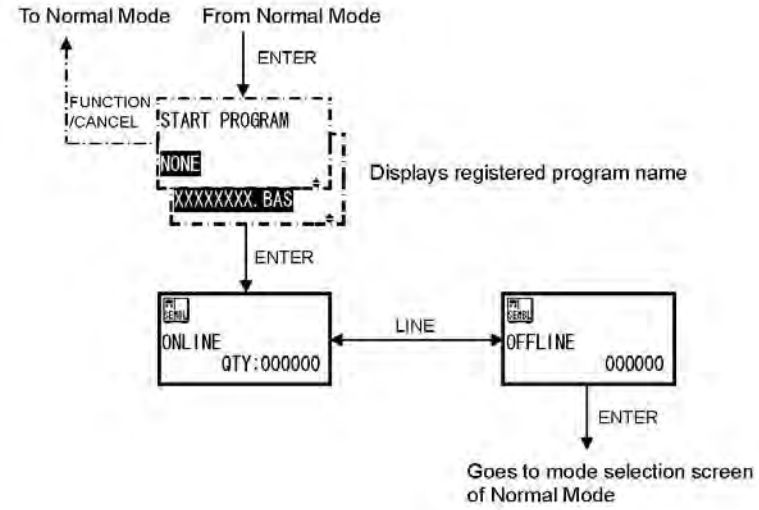


3.15 OVERVIEW OF INTERFACE/SEMBL MODE CONFIGURATIONS

CF Card Mode



SEMBL Mode



3.15 OVERVIEW OF ADVANCED MODE CONFIGURATIONS

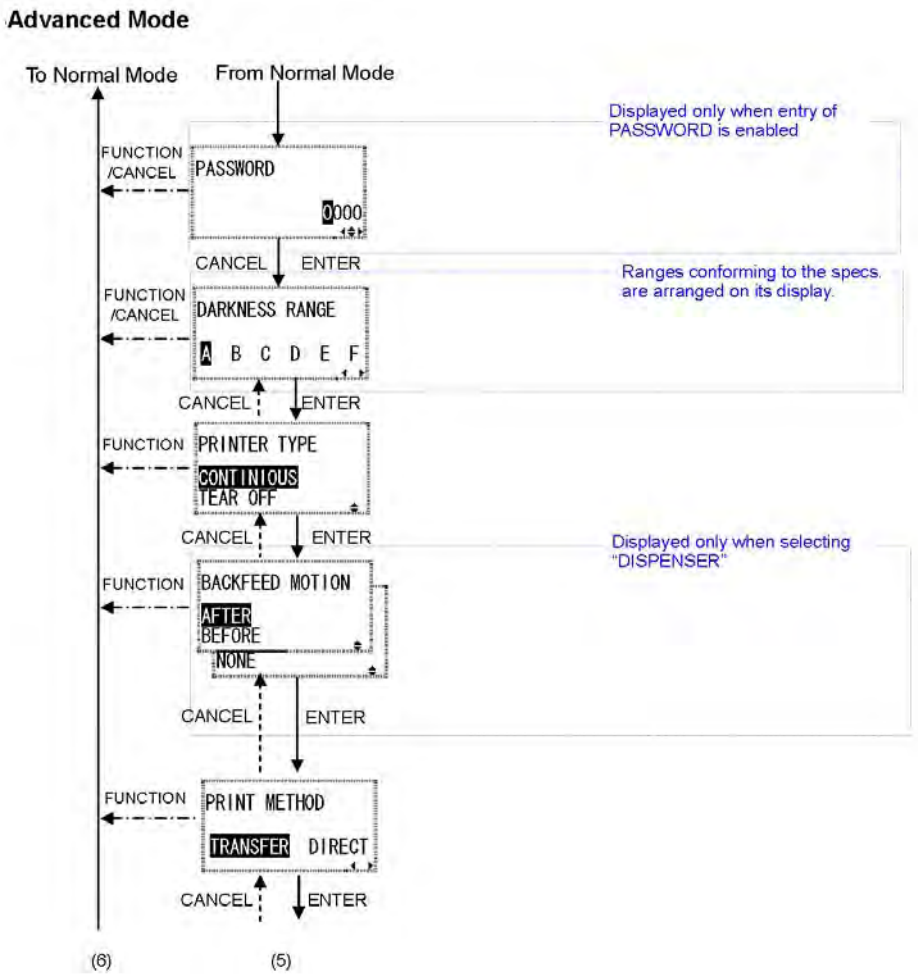


Chart continued on next page

3.15 OVERVIEW OF ADVANCED MODE CONFIGURATIONS (CONT'D)

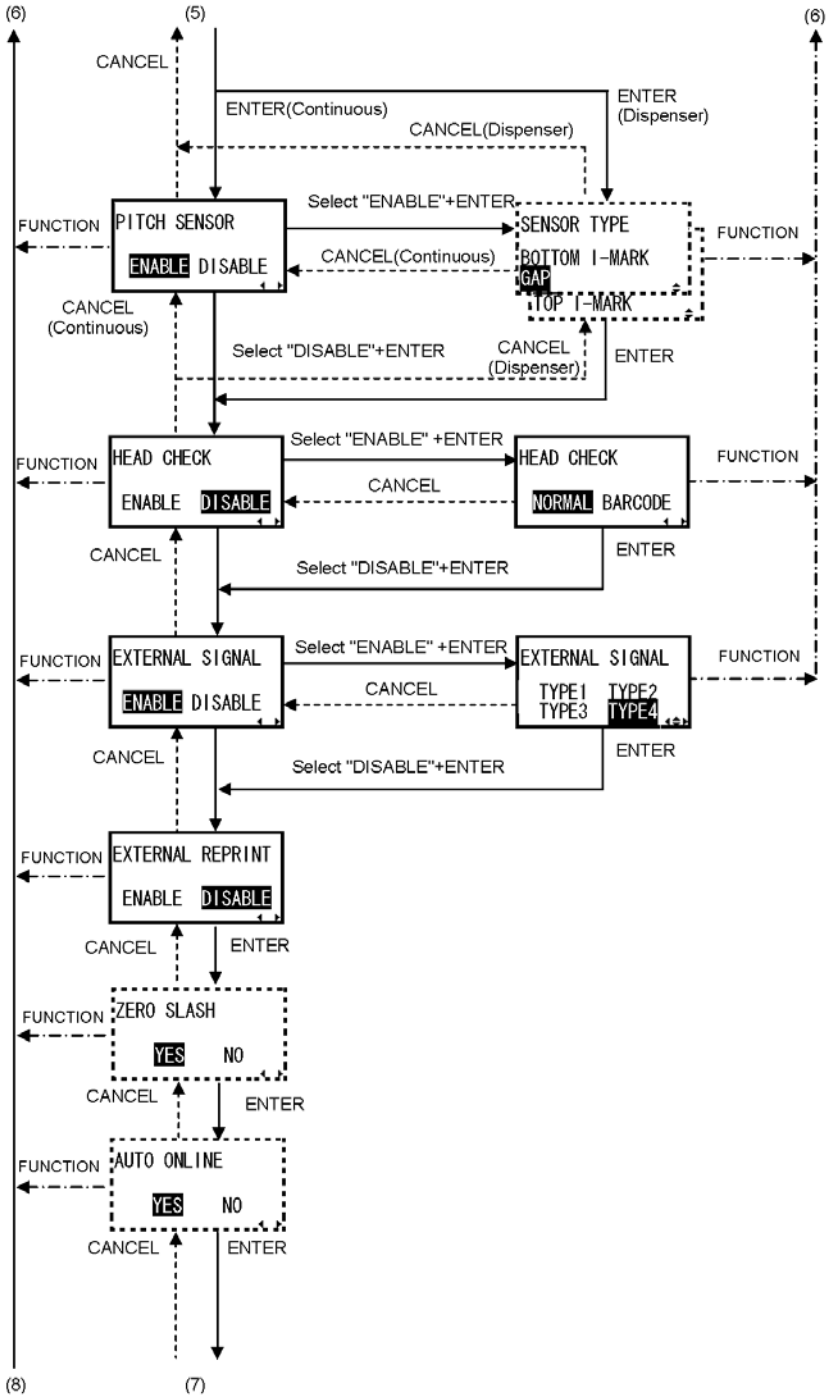
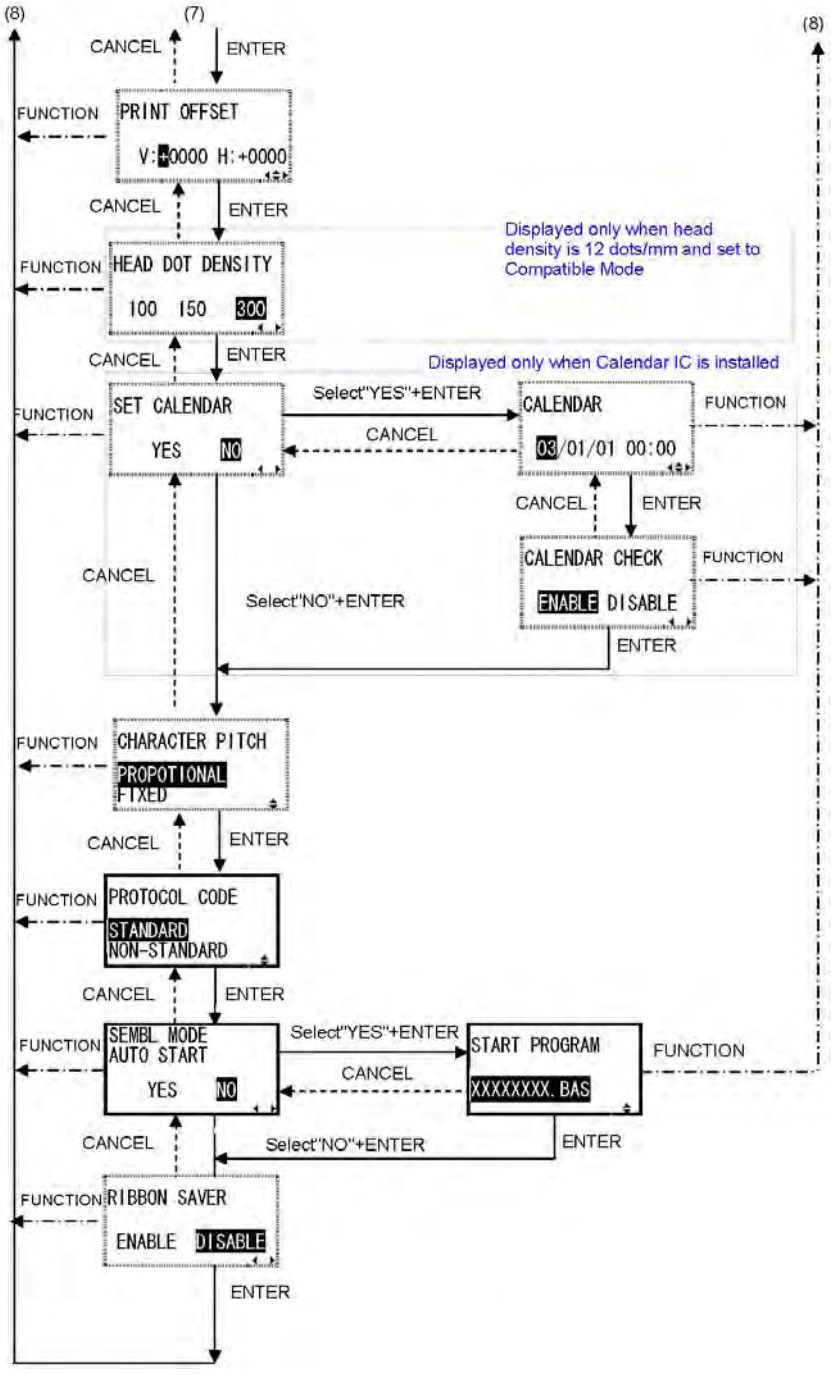
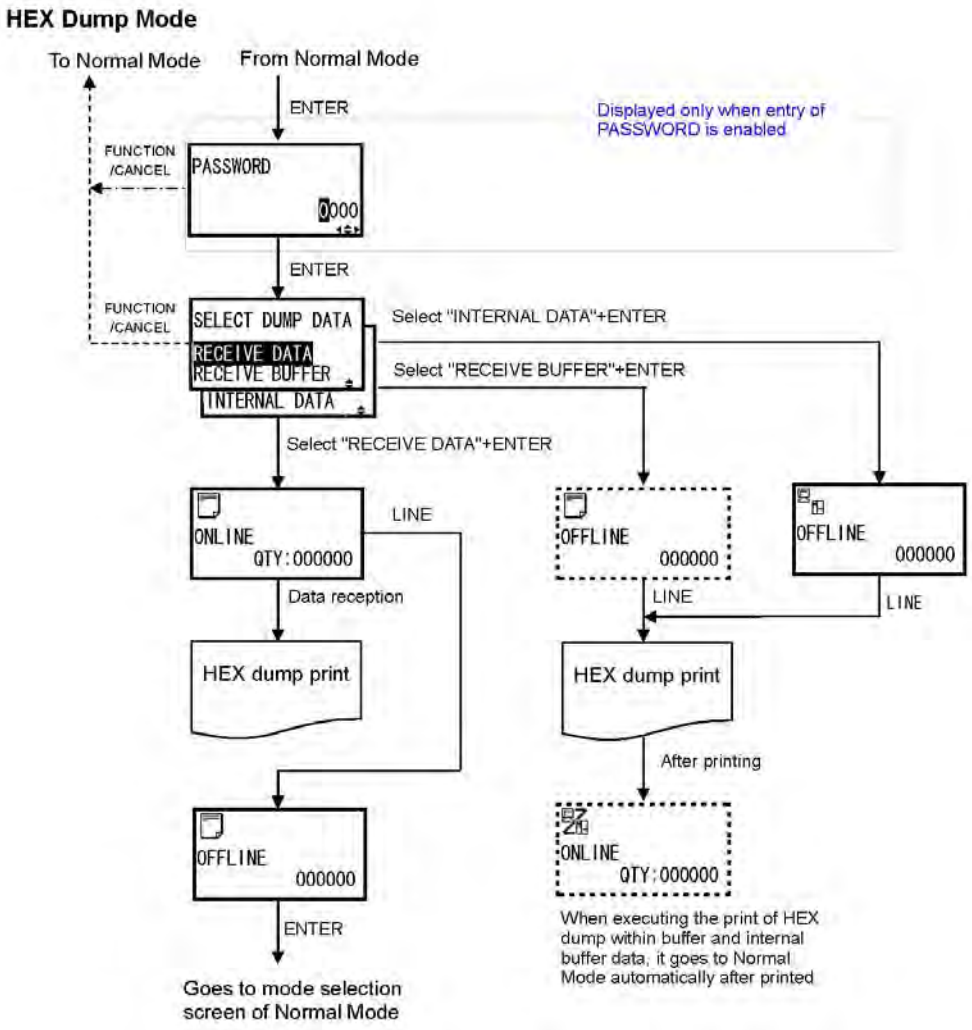


Chart continued on next page

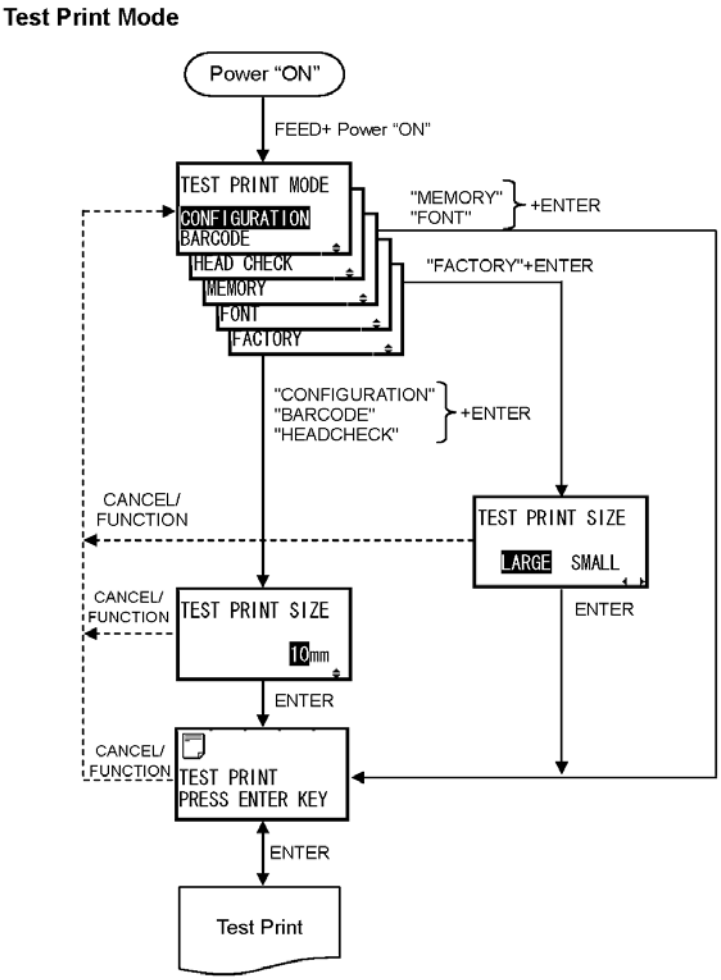
3.15 OVERVIEW OF ADVANCED MODE CONFIGURATIONS (CONT'D)



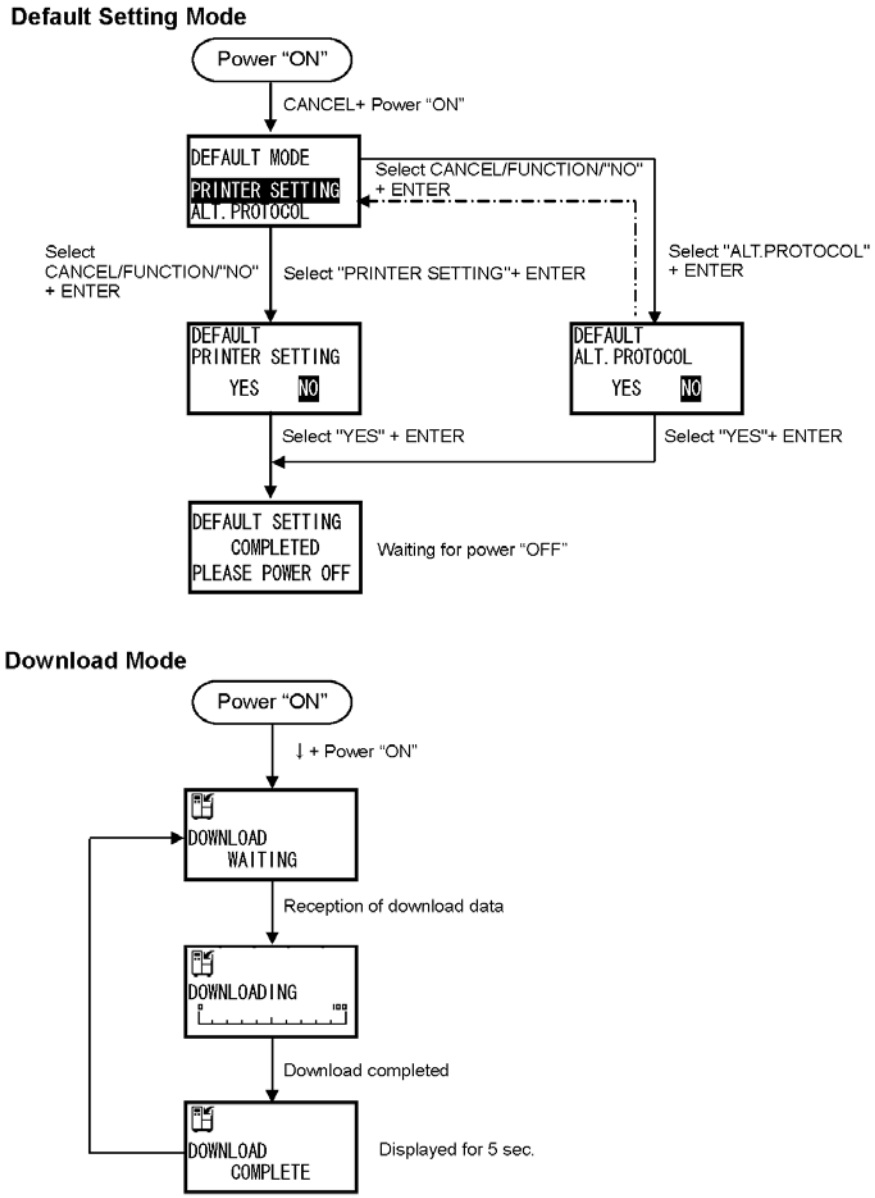
3.15 OVERVIEW OF HEX DUMP MODE CONFIGURATIONS



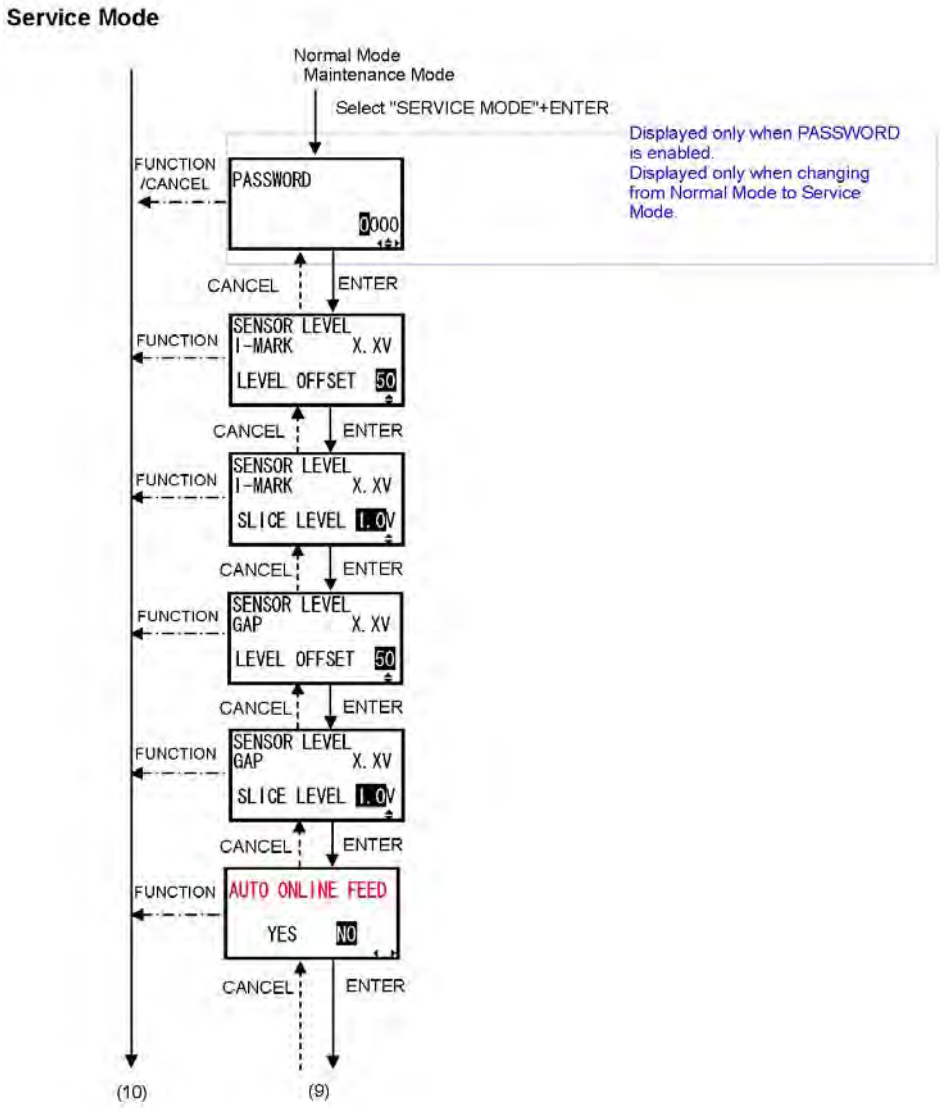
3.15 OVERVIEW OF TEST PRINT MODE CONFIGURATIONS



3.15 OVERVIEW OF DEFAULT/DOWNLOAD MODE CONFIGURATIONS



3.15 OVERVIEW OF SERVICE MODE CONFIGURATIONS



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3.15 OVERVIEW OF SERVICE MODE CONFIGURATIONS (CONT'D)

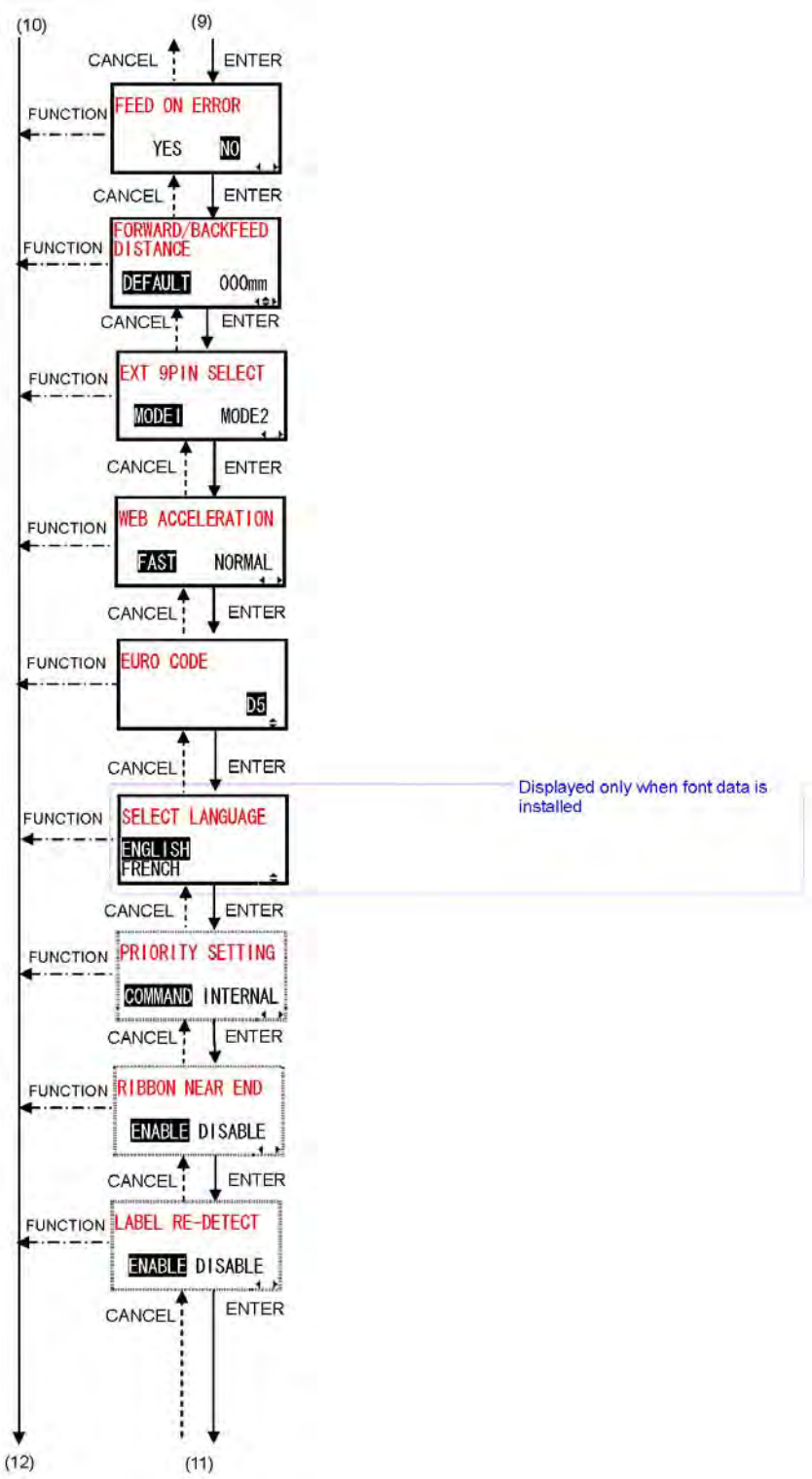


Chart continued on next page

3.15 OVERVIEW OF SERVICE MODE CONFIGURATIONS (CONT'D)

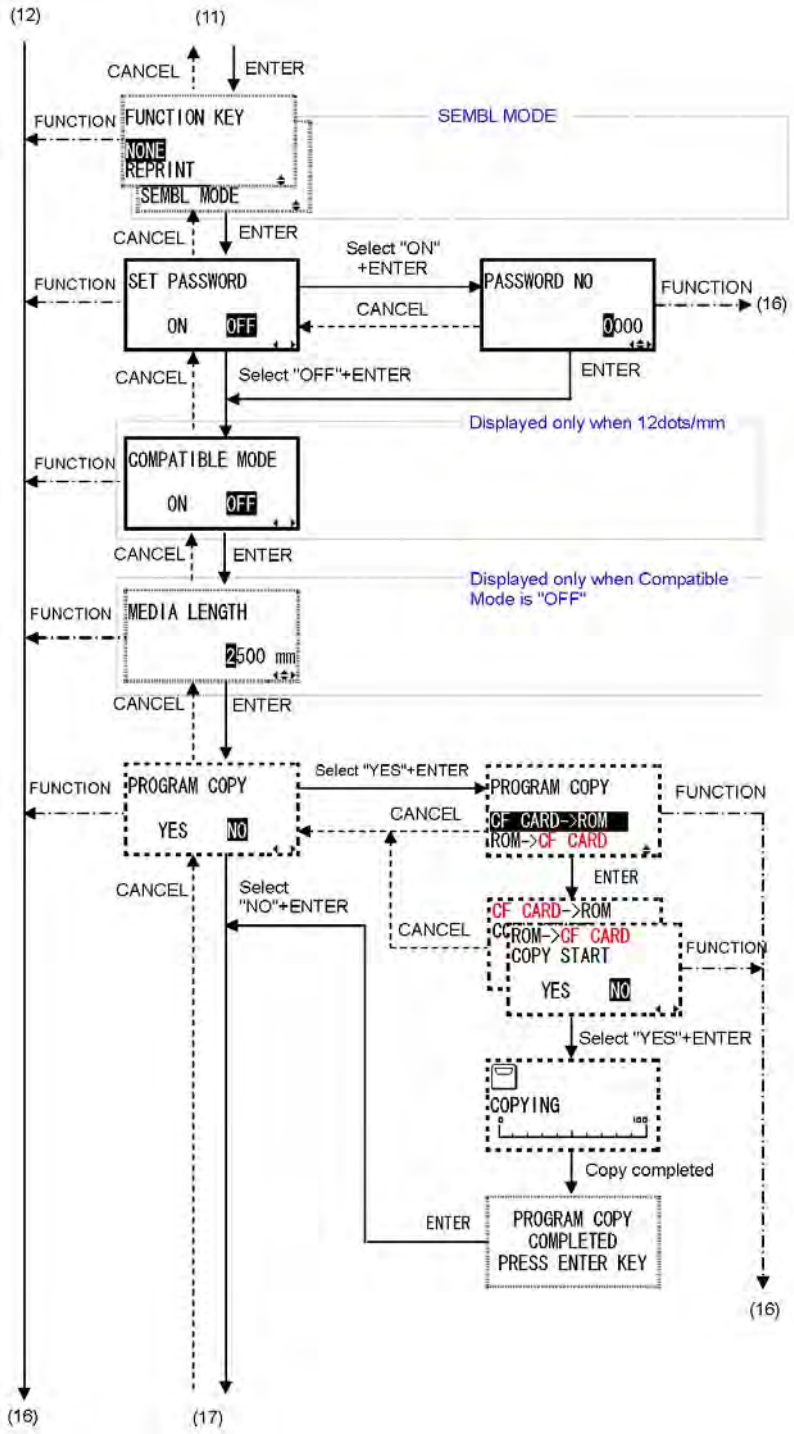
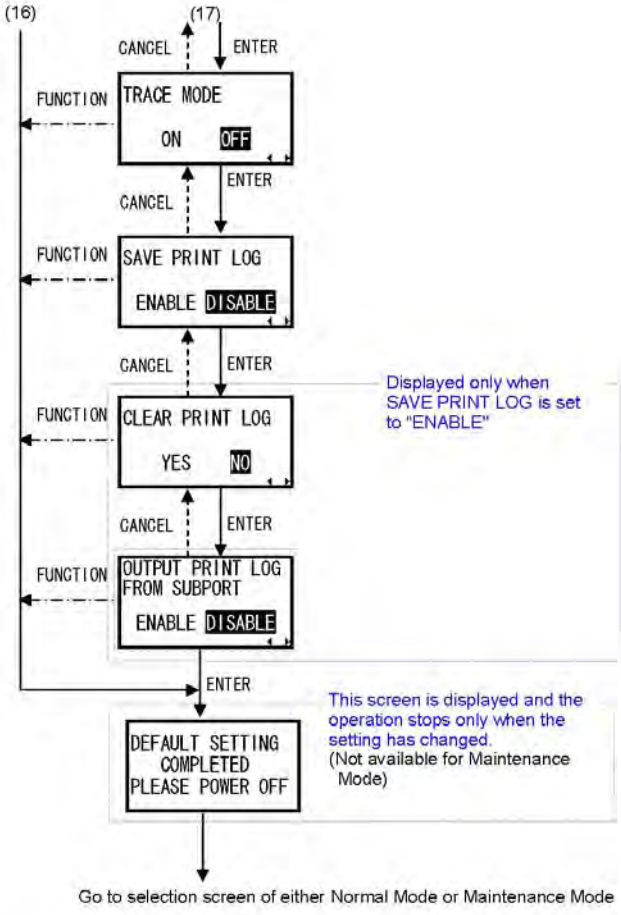
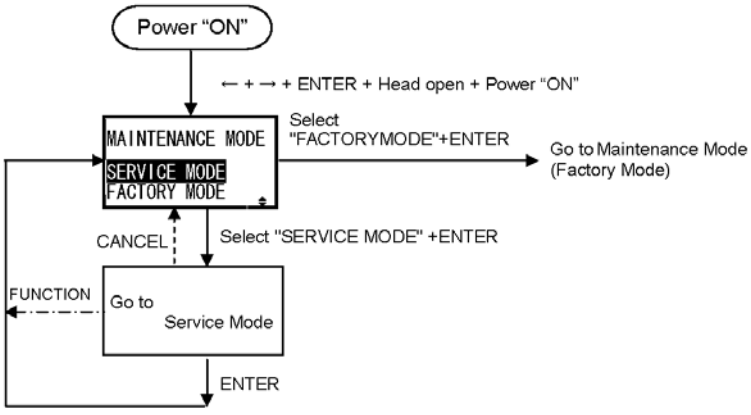


Chart continued on next page

3.15 OVERVIEW OF SERVICE MODE CONFIGURATIONS (CONT'D)



Maintenance Mode (Service Mode)



3.15 OVERVIEW OF MAINTENANCE MODE CONFIGURATIONS

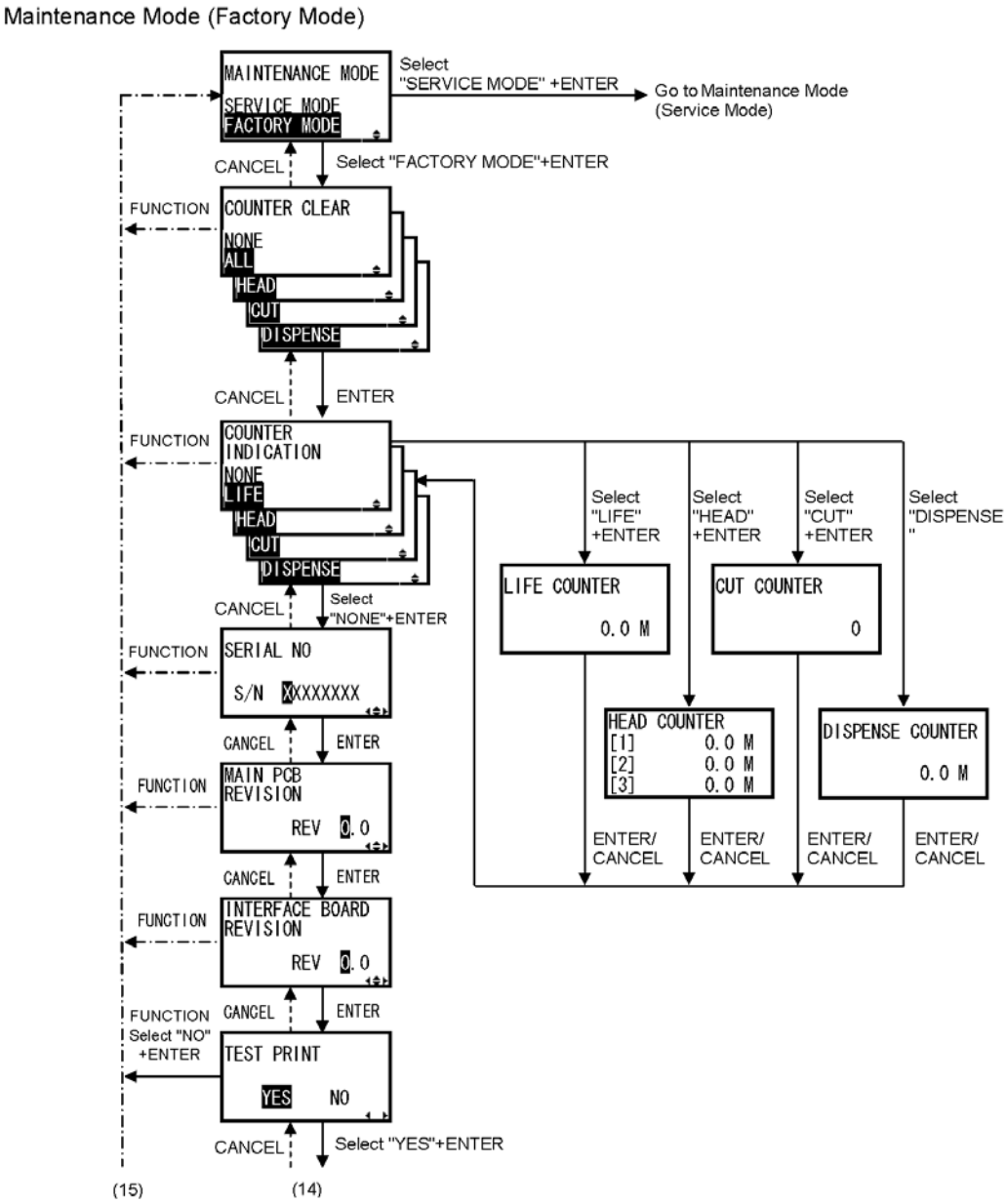
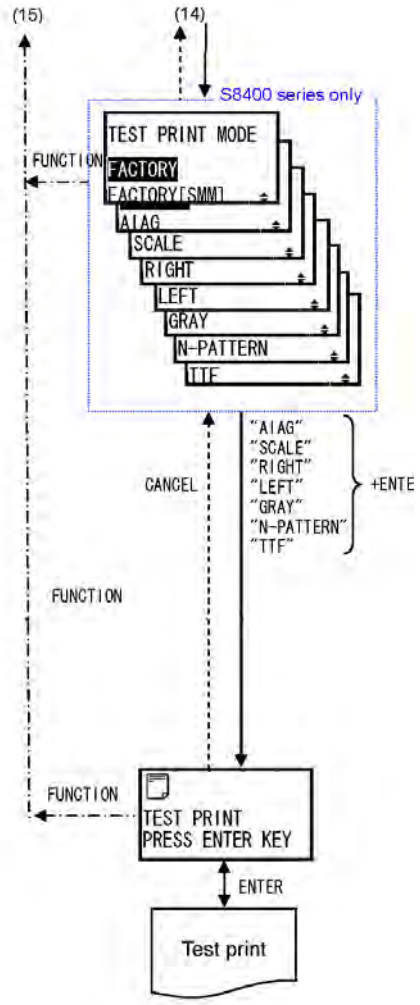
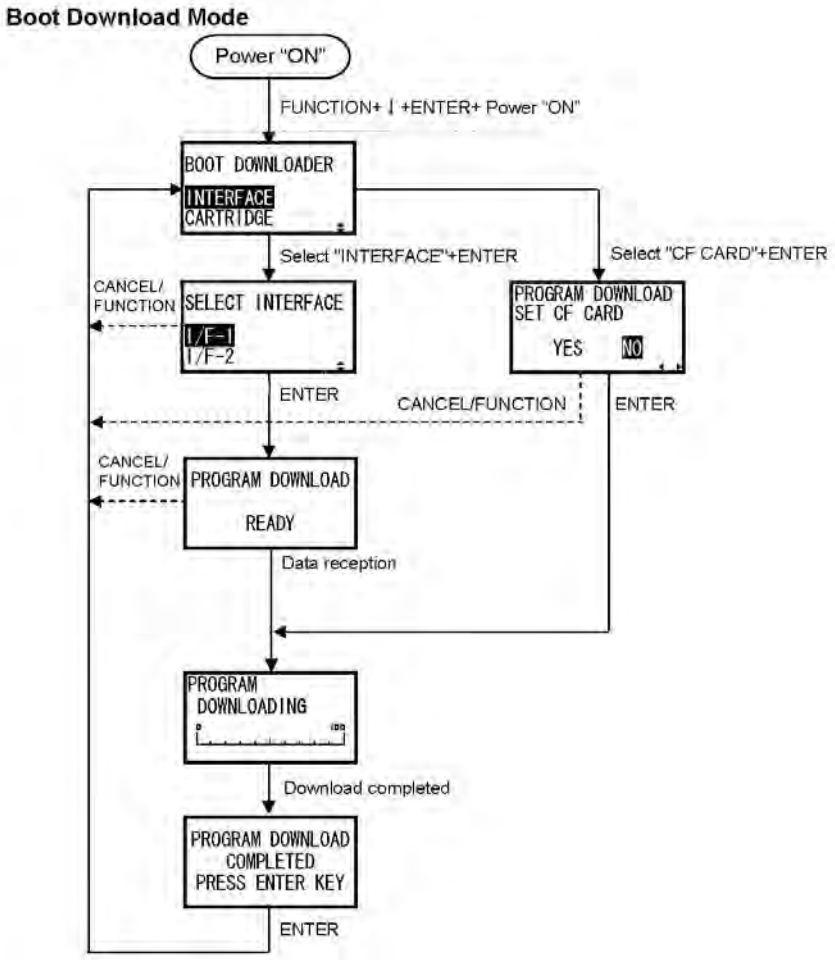


Chart continued on next page

3.15 OVERVIEW OF MAINTENANCE MODE CONFIGURATIONS (CONT'D)



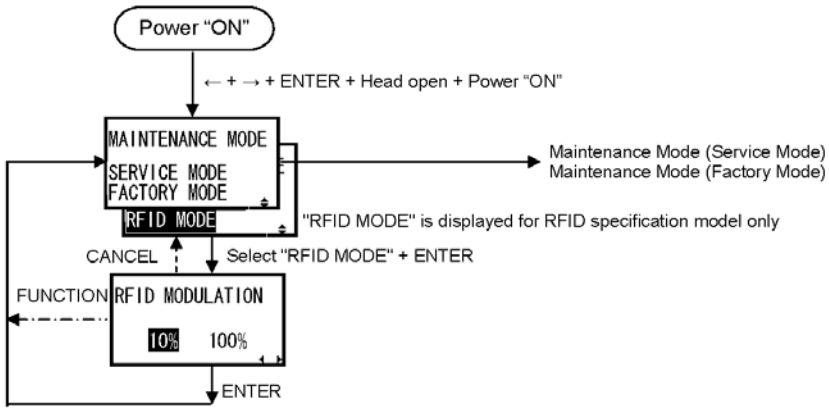
3.15 OVERVIEW OF BOOT DOWNLOAD MODE CONFIGURATIONS



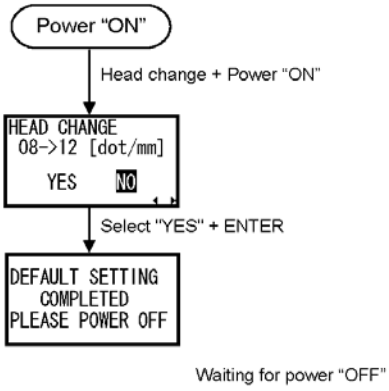
3.15 OVERVIEW OF RFID/DEFAULT MODE CONFIGURATIONS

RFID Mode

This mode is displayed only when the RFID option is applied.

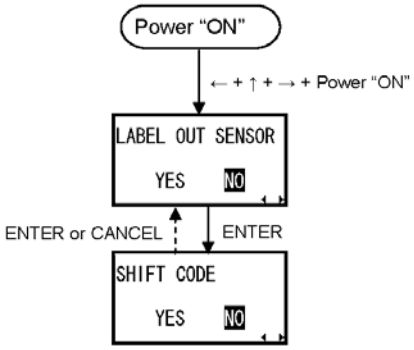


Default Setting Mode (Changing Head Density)

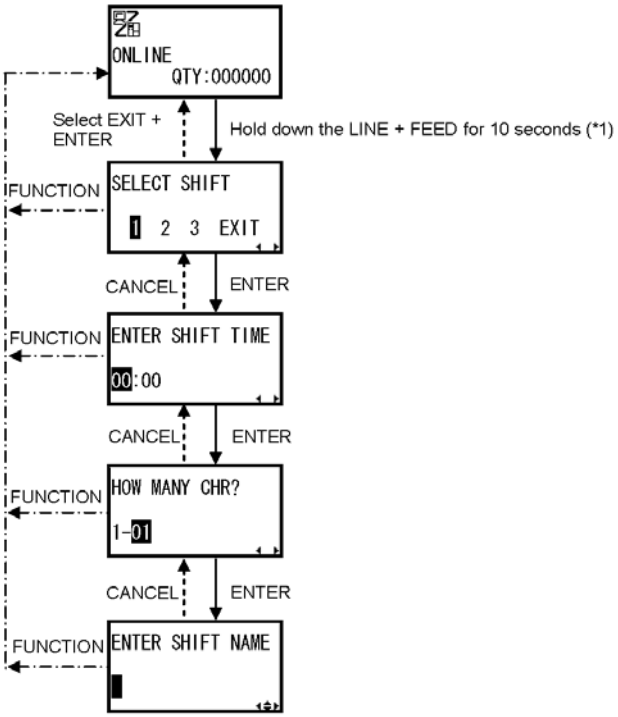


3.15 OVERVIEW OF HIDDEN AND WORKSHIFT MODES

Hidden Mode



Work Shift Mode

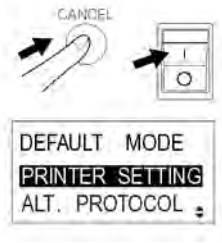


*1 : Enabled when SHIFT CODE of Hidden Setting Mode is set to YES.

3.16 RESTORING FACTORY DEFAULT SETTINGS

The printer is configured with default settings at the factory. During use, some of the default settings may be changed in a way that causes the printer to act in an undesirable manner. However, there is special Default Mode in which you can quickly restore all printer settings to the original factory settings as follows:

3.16.1 Entering Default Mode

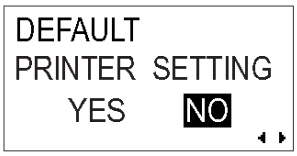


1. Make sure the printer has been turned OFF.

2. Hold down the **CANCEL** button and turn the printer ON. The following DEFAULT MODE display should appear. At any time within this mode, pressing **CANCEL** takes you back one screen. Pressing the **FUNCTION** button returns you immediately to the main Hex Dump screen.

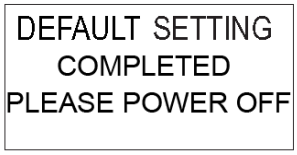
3. Press the ▲▼ arrow buttons to choose between PRINTER SETTING and ALT. PROTOCOL. The first option resets all settings to the default, while the ALT. PROTOCOL option resets only the protocol code. Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.16.2 If You Chose to Reset Printer Settings



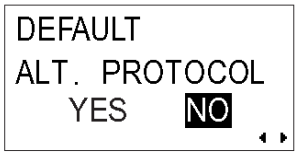
In the previous menu, if you chose PRINTER SETTINGS, the following screen appears.

4. Press the ◀▶ arrow buttons to choose between YES and NO. If you select NO (default), you will be returned to the main DEFAULT MODE screen.



5. Otherwise, press **ENTER** to proceed to reset printer settings. A final confirmation message appears, prompting you to restart the printer.

3.16.2 If You Chose Alt Protocol Code

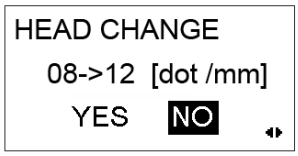


In the previous menu, if you chose the ALT. PROTOCOL option, the following screen appears.

4. Press the ◀ ▶ arrow buttons to choose between YES and NO. If you select NO, you will return to the main DEFAULT MODE screen.

5. Press **ENTER** to proceed to reset the Alt. Protocol code.

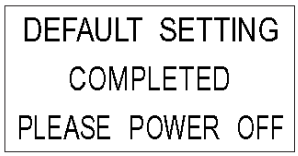
3.16.3 Setting of Print Resolution for New Print Head



If the printer detects that a different print head has been installed, the Default Mode displays the following menu to confirm the change of print resolution. The default setting is NO.

Press the ◀ ▶ arrow buttons to YES or NO.

3.16.4 Completion of Default Setting



After any settings chosen in the previous menus have been reset, the following screen appears.

Turn the printer OFF (and ON) to let the default settings take effect.

3.16.5 Table of Default Settings

Setting Item			Initial Value		
			S8400 series		
			8 dots/mm	12 dots/mm	24 dots/mm
User Mode					
	Print speed		6 inches	6 inches	3 inches
	Print darkness		3	3	3
	Pitch offset		+00		
	JIS code		JIS code		
	Kanji font		Gothic font		
Interface Mode					
	RS-232C configuration		Priority setting on interface board		
		Baud rate	19200		
		Parity bit	NONE		
		Stop bit	1		
		Character bit	8		
		RS-485 terminal number	01		
	LAN/Wireless LAN configuration		Priority setting on interface board		
		IP address	0.0.0.0		
		Subnet mask	0.0.0.0		
		Gateway address	0.0.0.0		
		LAN Port number1	1024		
		LAN Port number2	1025		
		LAN Port number3	9100		
		Wireless mode	802.11 Ad Hoc		
		SSID	(Space)		
		Channel	01		
	IEEE1284/Centronics ACK signal		0.5µs		
	Protocol		STATUS5		
	Item No. check		Disable		
	BCC check		Disable		
	Data port		I/F-2		
	Status reply timing		Cycle		
	Receive buffer		1 item		
	Deletion of CR/LF code		No		
	Deletion of CAN/DLE code		No		
Advanced Mode					
	Darkness range		A		
	Printer type auto setting		-		
	Backfeed motion		Before		
	Print method		Transfer		
	Sensor type		Gap		
	Head check		Disable		
	External signal		Enable/Type 4		
	External reprint		Disable		
	Zero slash		Yes		
	Auto online		Yes		
	Print offset		V: +0000 H: +0000		
	Head dot density				
	Calendar check		Disable		
	Character pitch		Proportional		
	Protocol code		Standard		
	Non-standard code		STX=7Bh	ETX=7Dh	ESC=5Eh
			ENQ=40h	CAN=21h	NULL=7Eh
			OFFLINE=5Dh		
	SEMBL mode auto start		Disable		
Service Mode					
	Sensor level (Slice level)		Automatic setting		
	Auto online feed		No		
	Feed on error		No		
	Forward/Backfeed distance		Default		
	EXT 9PIN select		Mode1		
	WEB acceleration		Fast		
	Euro code		D5h		
	Select language		English		
	Priority setting		Command		
	Ribbon near end		Enable		
	Label re-detect		Enable		
	Function key		None		
	Set password		Off (0000)		
	Compatible mode		Off		
	Media length		2500mm	1500mm	400mm
	Trace mode		Off		
	Save print log		Disable		
	Output print log from subport		Disable		
Factory Mode					
	Life counter		0		
	Head counter		0		
	Dispensing counter		0		
	Cut counter		0		
Hidden Mode					
	Label out sensor		Yes		
	Shift code		No		

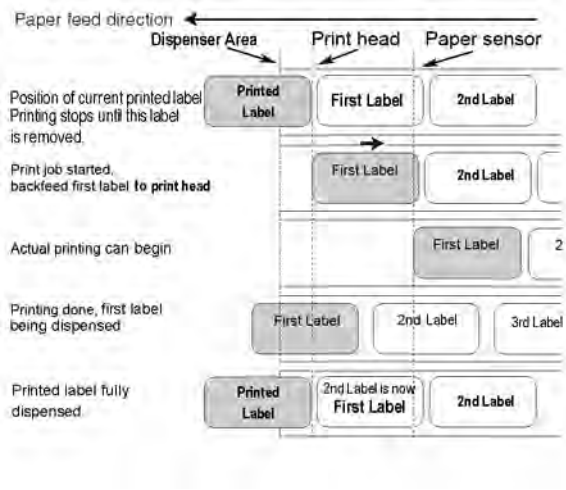
3.17 UNDERSTANDING DISPENSER AND CONTINUOUS PRINT OPERATION

Two modes — Dispenser and Continuous Print operation — are available for use in the S8400 series print engine. The difference between the two operations is in the way the label paper is ejected. Here are the details:

Dispenser Operation (Default)

In this method of operation, after printing, the printer feeds the first (outermost) label so that its bottom edge rests at the position of the dispenser area. This label can then removed. Printing does not resume until this label is removed.

Dispenser Operation

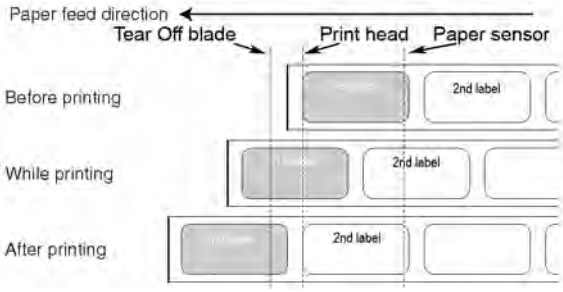


The label behind the dispensed label is now the first label. Its position has gone beyond the print head. Therefore, a backfeed is performed (optional). When the label is in position, printing begins.
It is then dispensed and printing stops while the printer waits for the dispensed label to be removed. The option to set Backfeed is in the Advanced Mode->Backfeed Motion menu (See page 3-13) .
You can disable the Backfeed or set it to occur BEFORE or AFTER print.

Continuous Print Operation

In this method of operation, whenever a print job has been completed (or when a sheet of paper is fed) the paper is ejected outwards until the second label from the front is placed just in front of the print head. The first label will not be completely ejected, and cannot be torn off neatly.

Continuous Print Operation



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4

CLEANING AND MAINTENANCE

4.1 INTRODUCTION

This section provides information on user maintenance for the S8400 series print engine. The following information is covered here:

- Cleaning the Print Head, Platen and Rollers
- Adjusting print quality

4.2 CLEANING THE PRINT HEAD, PLATEN AND ROLLERS

The print head not only generates printouts of barcodes, but also graphics and text. To produce optimal printing, it must be kept clean in spite of the dirt and adhesive that constantly accumulates on its print surface. Furthermore, dirt can accumulated along the label path, affecting parts like sensors and guides, and reducing their performance.

Therefore, it is important to clean these important components periodically. Depending on the region you are in, the SR8400 series print engine may already come supplied with a cleaning kit or set of cleaning sheets. If any of the cleaning items need replacement, contact your authorized SATO dealer.

When to clean with a cleaning kit

- For the print head, platen roller, pitch sensors, and label guide: clean after using up every other roll of paper, or each time after printing 150 m.
- For other parts: clean after finishing every six rolls of paper, or every time after printing 900 m.

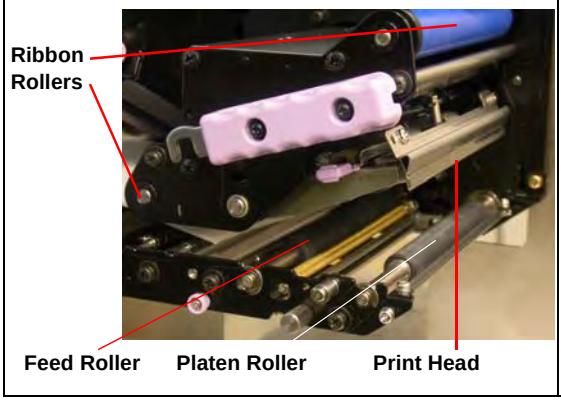
When to clean with the cleaning sheet

- For the print head, platen roller: clean after using every six rolls of paper, or every time after printing 900 m.

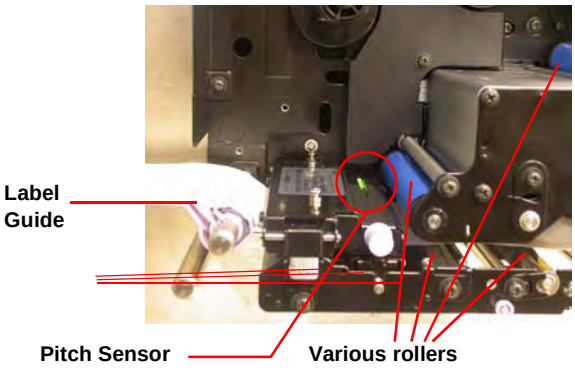
4.3 HOW TO CLEAN THE PRINTER (CLEANING SET)

If you are using a carbon ribbon, be sure to remove it before cleaning. Follow the instructions supplied with the cleaning set. Use the items to clean the following parts.

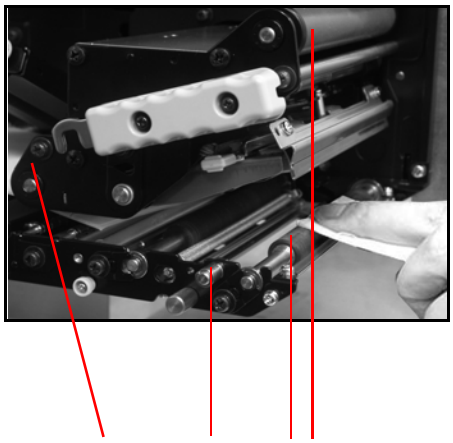
Print head and Rollers



Pitch (paper) Sensor and Label Guide



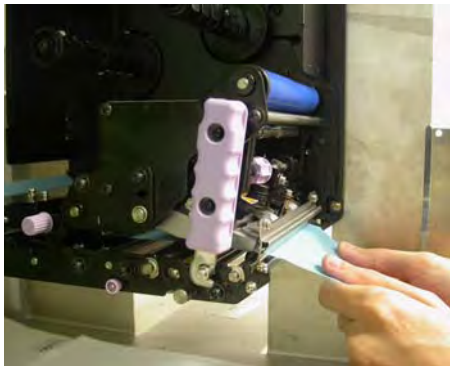
1. Lift up the front cover.
2. Unlatch the print head unit using the Head Lock Lever.
   The print head is now accessible.
3. Wipe off the dirt on the print head with a cleaning cloth or lint free cotton swab dabbed in an approved cleaning solution.
4. Moisten a cotton cleaning cloth with cleaning liquid, and use the cloth to wipe any dirt or accumulated adhesive off the platen roller. (See figure on the right). Repeat for the ribbon roller and other black rubber rollers as necessary.
5. If you are using linerless labels, also wipe off the dirt on the fixed cutter blade with a cleaning pen.



Clean the black rubber rollers: From left: Ribbon Roller, Platen Roller, Feed Roller

4.4 HOW TO CLEAN THE PRINTER (CLEANING SHEET)

The cleaning sheet is used for cleaning the print head and platen roller.



1. Lift up the front cover.
2. Unlatch the print head unit using the purple Head Lock lever and head release latch.
   The print head is now accessible.
3. Remove the label and ribbon.
4. Put the head cleaning sheet between the print head and the platen roller. The coarse side of the cleaning sheet should face the surface of the print head elements.
5. Fasten the Head Lock lever to mount the print head.
6. Using both hands, pull the cleaning sheet outwards, toward your body. This will remove any dirt stuck to the print head. (See generic figure on the right)
7. When the cleaning sheet has been removed, perform steps 2 to 6 to repeat the cleaning procedure one or two more times.
8. When no more additional dirt appears on the cleaning sheet after it has been pulled out, you can stop cleaning with the sheet.
9. Unlatch the print head and use the cleaning cloth from the cleaning kit to gently remove any remaining dirt from the print head.

For further details, refer to the instructions that accompany the cleaning sheet.

⚠ Caution

- Be sure to turn off the power before cleaning.
- The suggested cleaning schedule here are just guidelines. If necessary, clean as appropriate depending on the degree of contamination.
- Use a cleaning pen or cotton cloth to clean the printer units.
- Use only soft, lint-free materials for cleaning. Avoid using hard objects for the cleaning process, as they will damage the components.

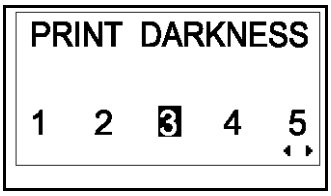
4.5 ADJUSTING PRINT QUALITY

Print quality can be optimized with regular cleaning and maintenance of the print head and components along the label path. Additionally, you can fine-tune print quality by adjusting print darkness and print speed settings.

4.5.1 Adjusting Print Darkness

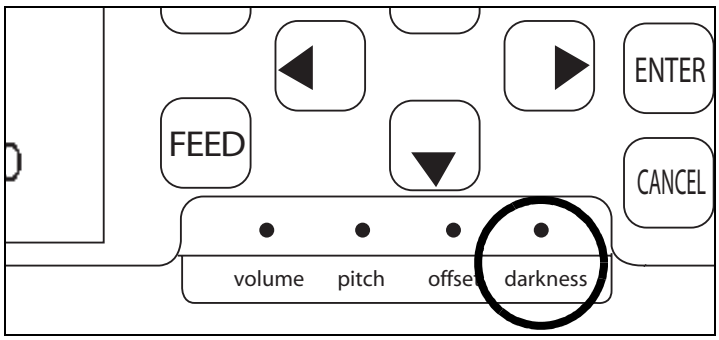
This adjustment allows the user to control (within a specified range) the amount of power applied to the individual print head heat elements. It is important to find a proper print darkness level based on your particular label and ribbon combination. The printed images should not be too light nor should the ink from the ribbon "bleed." The edges of each image should be crisp and well defined.

LCD Panel — The Print Darkness can be set from the configuration panel or by sending the Print Darkness software command from a computer. There are five settings, from 1 (lightest) to 5 (darkest). The default setting is 3.



Once the range has been selected, the Darkness Potentiometer on the front panel can be used to make finer adjustments. For instructions on setting Print Darkness, refer to Section 3, Configuration.

Darkness Potentiometer — The fine adjustment for Print Darkness is the Darkness Potentiometer hidden behind the front panel. It provides a continuous range of adjustment, allowing you to make precise changes. Use a small cross-point screwdriver, turning clockwise for darker print and counterclockwise for lighter print. See **Section 3: Configuration** for instructions on performing potentiometer adjustments.



Note

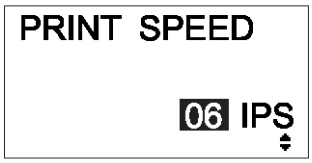
The PRINT potentiometer adjustment will affect the darkness in all of the command code speed ranges, i.e., if the PRINT potentiometer is adjusted for lighter print, the darkness will be lighter in all speed ranges selected by the command code.

4.5 ADJUSTING PRINT QUALITY (CONT'D)

4.5.2 Adjusting Print Speed

Besides varying the rate at which labels are printed, this adjustment can be used to regulate any changes in print quality.

LCD Panel — Print Speed can be set using the front panel LCD panel or by sending the Print Speed software command from a computer. If the current print quality needs to be improved, try setting a lower print speed.



For instructions on setting Print Speed, refer to page 3-7, Operation and Configuration.

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5

INTERFACE SPECIFICATIONS

For the basic reference of users who need a basic overview of the S8400 series data port, this chapter covers only the **basic technical details** and timing charts for the most common interfaces: RS-232C, IEEE1284 and Centronics. For programming and advanced technical interface requirements, please refer to Programming Reference available separately on the accessory CD-ROM or from your SATO representative.

5.1 INTERFACE TYPES

The S8400 series print engine comes with three rear sockets for connection to three signal interfaces.

The topmost slot is a PCI bus for connection to an optional USB interface card for use as SUB port. The interface slot below this slot is the **main interface slot** for any compatible interface card to supply a DATA port. The bottommost slow is for the supplied 14-pin External (EXT) interface for use as a control port to drive peripherals such as unwinders.

At the time of purchase, the print engine is supplied with a single interface of the user's choice: typically a parallel interface is used for transmitting data to and from the host computer.

The EXT signal interface can be used to send printer status information to time the operation of external peripherals.

The following are the different types of interface boards available for use as the DATA port:

1) RS232C Interface Board

2) Parallel Interface Board

3) IEEE 1284 Interface Board

4) USB Interface Board (Ver. 1.1)

5) LAN Interface Board (10Base-T/100Base-T)

6) IEEE 802.11b Wireless LAN Interface Board

5.2 INTERFACE CARD DIP SWITCH SETTINGS (RS-232C)

The S8400 series super-speed serial interface card (optional) contains DIP switches for controlling communication conditions. The DIP switch functions are:

Switch No.	Function	Description	
1	Data length setting	ON: 7 Data Bits OFF: 8 Data Bits	
2 3	Parity bit setting	OFF — OFF: None OFF — ON: Even number ON — OFF: Odd number ON — ON: Not used	
4	Stop bit setting	ON: 2 Stop Bits OFF: 1 Stop Bit	
5 6	Baud rate setting	OFF — OFF: 9600 bps OFF — ON: 19200 bps ON — OFF: 38400 bps ON — ON: 37600 bps	
7	Communication Protocol setting	1-7 1-8 Compatibility mode OFF	Compatibility mode ON
8		OFF OFF: READY/BUSY OFF ON : XON/XOFF ON OFF : Driver specific protocol ON ON : Not used	READY/BUSY XON/XOFF Status 3 Status 2

⚠ Caution

Always turn the print engine OFF before attaching or detaching an interface card. Otherwise, severe electrical damage may be incurred, or bodily injury may be sustained.

Note:

Check the setting seal of the serial interface card.
The correct settings may vary depending on the type and revision of the board.
Any communication settings not controlled by the DIP switches can be set in the print engine's Interface Mode (See Section 3.6) using the operation panel.

5.3 INTERFACE CARD DIP SWITCH SETTINGS (LAN)

The S8400 series Local Area Network interface card (optional) contains DIP switches for initializing LAN configuration, LAN printing configuration, and LAN card self-diagnosis. The DIP switch functions are:

Switch No.	S8400 series LAN Interface Card function
1	Reserved
2	Initializes LAN card configuration information
3	Prints LAN card configuration information (configuration information such as the IP address will be printed)
4	Prints LAN card self-examination (results of LAN card examination will be printed)

5.4 INTERFACE CARD DIP SWITCH SETTINGS (WIRELESS LAN)

The S8400 series Wireless Local Area Network interface card (optional) contains DIP switches for initializing LAN configuration, LAN printing configuration, LAN card self-diagnosis and wireless mode settings. The DIP switch settings must be made before installing the card into the print engine. The DIP switch functions are:

<table>
<tr><th>Switch No.</th><th colspan="2">S8400 series Wireless LAN Interface Card function</th></tr>
<tr><td>1</td><td colspan="2">Reserved</td></tr>
<tr><td>2</td><td colspan="2">Initializes LAN card configuration information</td></tr>
<tr><td>3</td><td colspan="2">Prints LAN card configuration information (configuration information such as the IP address will be printed)</td></tr>
<tr><td>4</td><td colspan="2">Prints LAN card self-examination (results of LAN card examination will be printed)</td></tr>
<tr><td>5</td><td rowspan="2">Wireless Communication mode</td><td rowspan="2">OFF—OFF : 802.11 Ad hoc
OFF—ON : Infrastructure
ON—OFF : Ad hoc
ON—ON : Unused</td></tr>
<tr><td>6</td></tr>
</table>

5.5 EXTERNAL SIGNAL INTERFACE

The S8400 series print engine is fitted with a standard EXT Signal Interface card (14-pin Amphenol connector) which can be used to send printer status information and electrical power to compatible devices. The status information can also be used to time the control of peripherals operating further down the production line.

An optional replacement card with 25-pin D-Sub (RS-232) connector can also be purchased to replace the standard card.

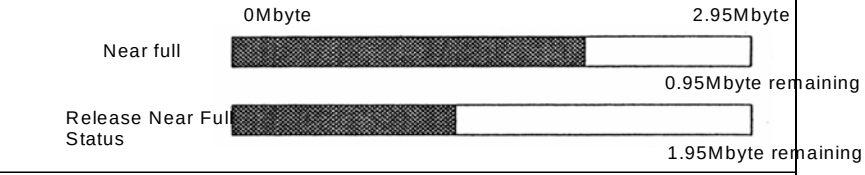
The EXT card operates in its own slot and does not interfere with the use of the main DATA port interface card such as RS-232C or Parallel card.

For more information on purchasing the optional 25-pin EXT card, contact your nearest authorized SATO represenative. For more information on the status information obtainable from the EXT Signal Interface, refer to the Service Manual available separately from SATO.

5.6 SERIAL INTERFACE SPECIFICATIONS (RS-232C)

The serial interface of this print engine conforms to the RS-232C standard.
There are two types of receive modes: 1. Single Job Buffer 2. Multi Job Buffer
These can be set using the dip switches.

Basic Specifications

<table>
<tr><td>Standard Interface</td><td>On the interface board</td></tr>
<tr><td>Dip Switch
1) Character configuration
2) Transmission speed
3) Protocol</td><td>
<table>
<tr><td>1-1</td><td>Data bit length</td><td colspan="2">OFF</td><td colspan="2">8 bits</td></tr>
<tr><td></td><td></td><td colspan="2">ON</td><td colspan="2">7 bits</td></tr>
<tr><td rowspan="5">1-2
1-3</td><td rowspan="5">Parity bit (2-3)</td><td>DSW1-2</td><td>DSW1-3</td><td colspan="2"></td></tr>
<tr><td>OFF</td><td>OFF</td><td colspan="2">NONE</td></tr>
<tr><td>OFF</td><td>ON</td><td colspan="2">EVEN</td></tr>
<tr><td>ON</td><td>OFF</td><td colspan="2">ODD</td></tr>
<tr><td>ON</td><td>ON</td><td colspan="2">Not used</td></tr>
<tr><td>1-4</td><td>Stop bit</td><td colspan="2">OFF</td><td colspan="2">1 bit</td></tr>
<tr><td></td><td></td><td colspan="2">ON</td><td colspan="2">2 bits</td></tr>
<tr><td rowspan="5">1-5
1-6</td><td rowspan="5">Baud rate (5-6)</td><td>DSW1-5</td><td>DSW1-6</td><td>DIPSW2-8 OFF*</td><td>DIPSW2-8 ON</td></tr>
<tr><td>OFF</td><td>OFF</td><td>9600bps</td><td>9600bps</td></tr>
<tr><td>OFF</td><td>ON</td><td>19200bps</td><td>19200bps</td></tr>
<tr><td>ON</td><td>OFF</td><td>38600bps</td><td>4800bps</td></tr>
<tr><td>ON</td><td>ON</td><td>57600bps</td><td>2400 bps</td></tr>
<tr><td rowspan="5">1-7
1-8</td><td rowspan="5">Protocol (7-8)</td><td>DSW1-7</td><td>DSW1-8</td><td>DIPSW2-8 OFF*</td><td>DIPSW2-8 ON</td></tr>
<tr><td>OFF</td><td>OFF</td><td>Ready/Busy</td><td>Ready/Busy</td></tr>
<tr><td>OFF</td><td>ON</td><td>X-on-Xoff</td><td>X-on-Xoff</td></tr>
<tr><td>ON</td><td>OFF</td><td>Status 3 echo</td><td>Status 3 echo</td></tr>
<tr><td>ON</td><td>ON</td><td>Driver protocol</td><td>Status2 echo</td></tr>
</table>
Note: The switch between Single Job Buffer and Multi Job Buffer can be specified by software. *Valid if Compatible Mode is disabled in the printer via the Service Mode menu.
</td></tr>
<tr><td>Synchronization mode</td><td>Asynchronous</td></tr>
<tr><td>Maximum Receivable Buffer capacity</td><td>2.95Mbyte
 
</td></tr>
<tr><td>Code used</td><td>ASCII(7 bit) Graphics(8 bit)</td></tr>
<tr><td>Connectors</td><td>Printer side DB-25S (Female)
Cable side DB-25P (Male)
Cable length 5 meters or less</td></tr>
<tr><td>Transmission format</td><td>
<table>
<tr><td>Start</td><td>b1</td><td>b2</td><td>b3</td><td>b4</td><td>b5</td><td>b6</td><td>b7</td><td>b8</td><td>Stop</td></tr>
</table>
Note b8 is not applicable when using 7 bits.
</td></tr>
<tr><td>Signal level</td><td>High level: +5 ~ +12V
Low level: -5 ~ -12V</td></tr>
</table>

5.7 READY/BUSY

Ready / Busy is the hardware flow control method for the serial interface on the print engine. Data received cannot be guaranteed, when print data (ESC+"A"~ESC+"Z") is sent from the host, under the following conditions:
1) When the print engine is Offline
2) When an error has occurred in the print engine

Pin Assignments

1) DB-25 P			DB-25 P	
Printer			Host	
FG	1	———	1	FG
SD	2	——→	3	RD
RD	3	←——	2	SD
RS	4	——→	5	CS
CS	5	←——	4	RS
DR	6	←——	20	ER
SG	7	———	7	SG
ER	20	——→	6	DR

2) DB-25P			DB-9P	
Printer			Host	
FG	1			
SD	2	——→	2	RD
RD	3	←——	3	SD
RS	4	——→	8	CS
CS	5	←——	7	RS
DR	6	←——	4	ER
SG	7	———	5	SG
ER	20	——→	6	DR

When using Windows Hardware Control:

3) DB-25 P			DB-25 P	
Printer			Host	
FG	1	———	1	FG
SD	2	——→	3	RD
RD	3	←——	2	SD
CS	5	←——	20	ER
RS	4	——→	6	DR
DR	6	←——	4	RS
SG	7	———	7	SG
ER	20		5	CG

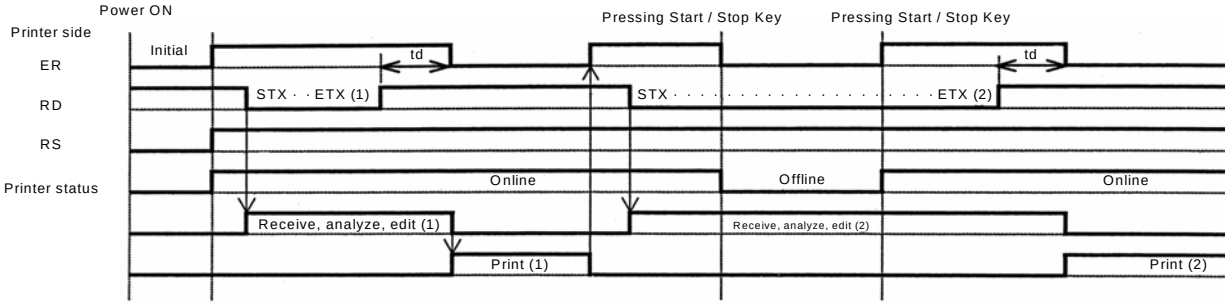
4) DB-25P			DB-9P	
Printer			Host	
FG	1			
SD	2	——→	2	RD
RD	3	←——	3	SD
CS	4	←——	4	ER
RS	5	——→	6	DR
DR	6	←——	7	RS
SG	7	———	5	SG
ER	20	——→	6	CS

Interface Signals

Pin no.	Signal Type	Direction	Contents
1	FG	-	Frame Ground
2	SD	Output	Send Data
3	RD	Input	Receive Data
4	RS	Output	Request to Send
5	CS	Input	Clear to Send
6	DR	Input	Data Set Ready
7	SG	-	Signal Ground
20	ER	Output	Eqpt Ready (also used for handling error status)

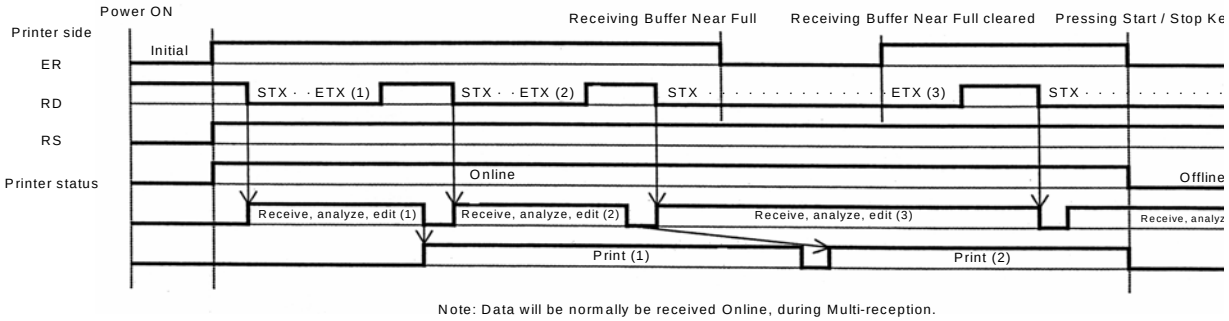
5.8 SINGLE JOB BUFFER

Timing Chart — Normal Processing


Power ON
Pressing Start / Stop Key
Pressing Start / Stop Key
Printer side
Initial
td
td
ER
STX · · ETX (1)
STX · · ·

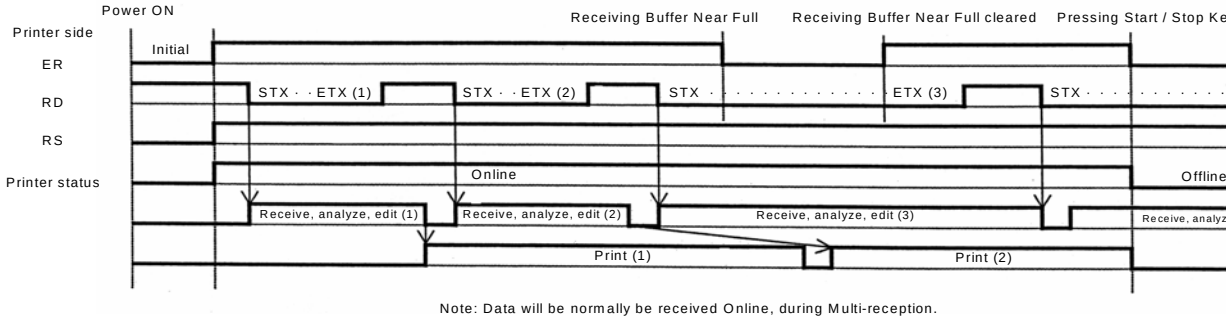
5.9 MULTI JOB BUFFER

Timing Chart — Normal Processing


Power ON
Receiving Buffer Near Full
Receiving Buffer Near Full cleared
Pressing Start / Stop Ke
Printer side
Initial
ER
RD
RS
Printer status
STX · · ETX (1)
STX · · ETX (2)
STX · · · · · · · · · · · · · · · · ETX (3)
STX · · · · · · · · · · · · · · · · ·
Online
Offline
Receive, analyze, edit (1)
Receive, analyze, edit (2)
Receive, analyze, edit (3)
Receive, analyz
Print (1)
Print (2)

Note: Data will be normally be received Online, during Multi-reception.

Timing Chart — Error Processing


Power ON
Receiving Buffer Near Full
Receiving Buffer Near Full cleared
Pressing Start / Stop Ke
Printer side
Initial
ER
RD
RS
Printer status
STX · · ETX (1)
STX · · ETX (2)
STX · · · · · · · · · · · · · · · · ETX (3)
STX · · · · · · · · · · · · · · · · ·
Online
Offline
Receive, analyze, edit (1)
Receive, analyze, edit (2)
Receive, analyze, edit (3)
Receive, analyz
Print (1)
Print (2)

Note: Data will be normally be received Online, during Multi-reception.

5.10 X-ON/X-OFF

This transmission protocol informs the host if the print engine can receive data or not, by sending the "XON" (Hex 11H) or "XOFF" (Hex 13H) code.

Data received cannot be guaranteed, when print data (ESC+"A"~ESC+"Z") is sent from the host, under the following conditions:

1) When the print engine is Offline
2) When an error has occurred in the print engine

Pin Assignments

1) DB-25 P			DB-25 P	
Printer			Host	
FG	1	———	1	FG
SD	2	——→	3	RD
RD	3	←——	2	SD
RS	4		5	CS
CS	5		4	RS
DR	6		20	ER
SG	7	———	7	SG
ER	20		8	DR

2) DB-9P			DB-9P	
Printer			Host	
FG	1			
SD	2	——→	2	RD
RD	3	←——	3	SD
RS	4	⌐	8	CS
CS	5	⌙	7	RS
DR	6		4	ER
SG	7	———	5	SG
ER	20		6	AR

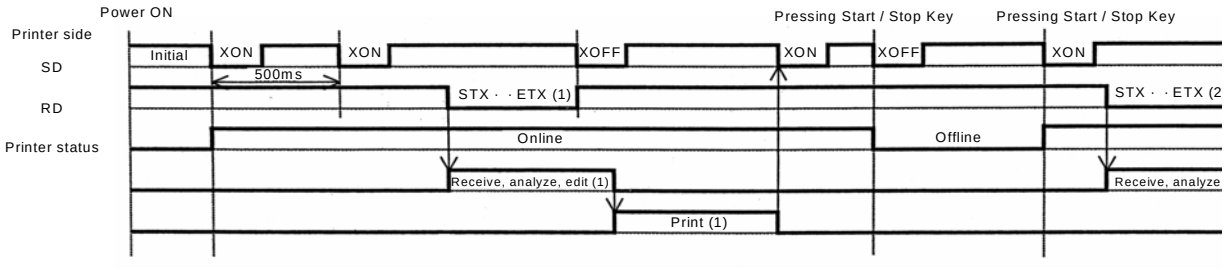
Caution!
In the connections, it may be necessary to loop (usually kept "High) CS and RS on the host side depending on the type of host. Therefore, make sure to re-check the host before use.

Input/Output Signals

Pin no.	Signal Type	Direction	Contents
1	FG	-	Frame Ground
2	SD	Output	Send Data
3	RD	Input	Receive Data
7	SG	-	Signal Ground

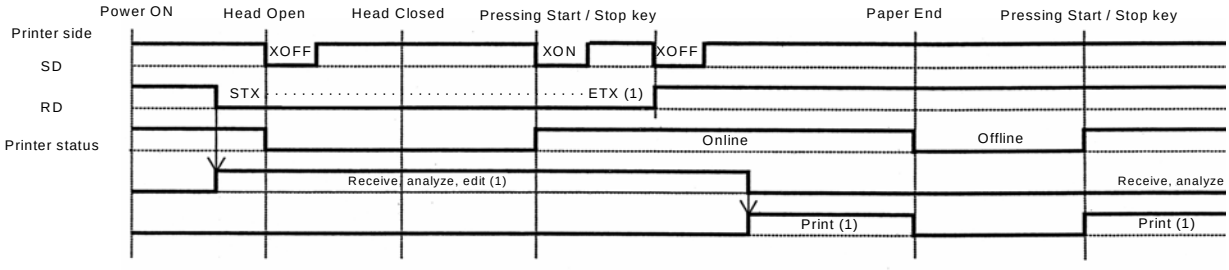
5.11 SINGLE JOB BUFFER

Timing Chart — Normal Processing



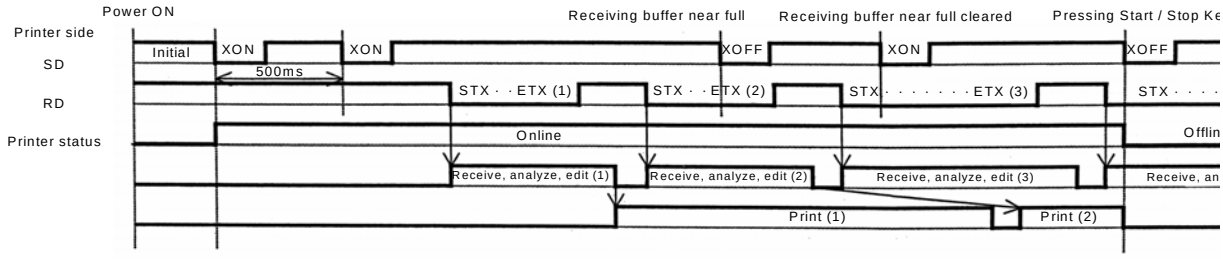
Note: This protocol will execute an “XON” polling at an interval of 500ms, from the moment the power is turned on until the recept

Timing Chart — Error Processing


Power ON
Head Open
Head Closed
Pressing Start / Stop key
Paper End
Pressing Start / Stop key
Printer side
SD
RD
Printer status
XOFF
XON
XOFF
STX · · ·

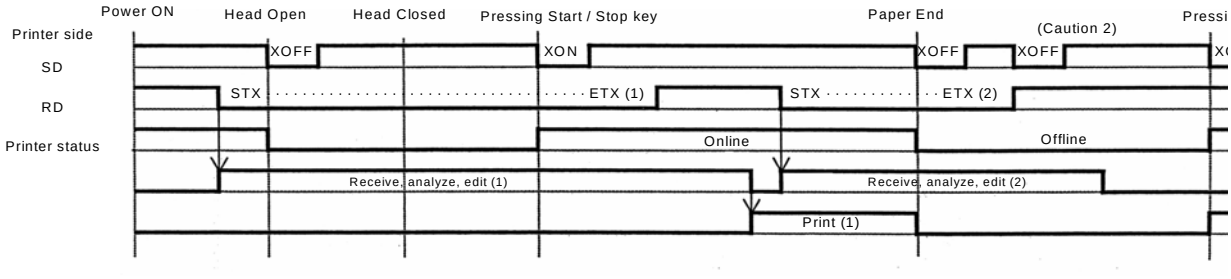
5.12 MULTI JOB BUFFER

Timing Chart — Normal Processing



Note: This protocol will execute an “XON” polling at an interval of 500ms, from the moment the power is turned on until the recept

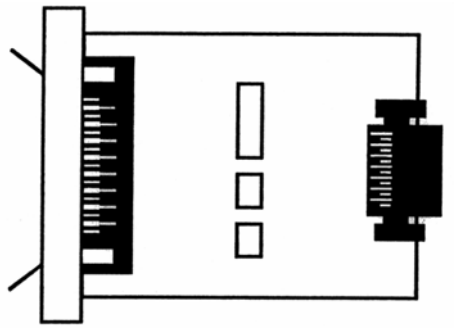
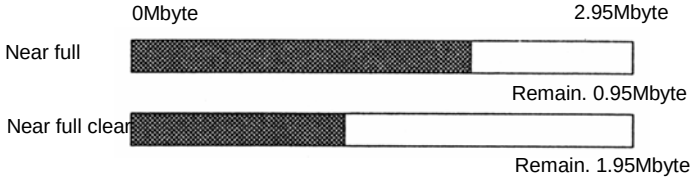
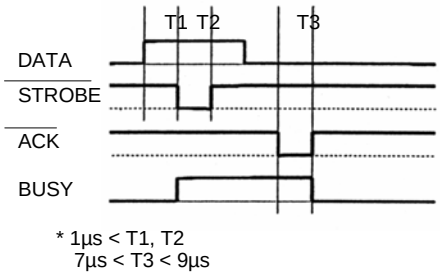
Timing Chart — Error Processing


Power ON
Head Open
Head Closed
Pressing Start / Stop key
Paper End
(Caution 2)
Pressi
Printer side
SD
RD
Printer status
XOFF
XON
XOFF
XOFF
STX · · · · · · ·

5.13 PARALLEL INTERFACE SPECIFICATIONS (CENTRONICS)

The parallel interface of this print engine conforms to Centronics standards.

Basic Specifications

<table>
<tr><td>Interface board</td><td>  </td></tr>
<tr><td>Connector</td><td>Printer Amphenol (DDK) 57 to 40360 (Equivalent)
Cable Amphenol (DDK) 57 to 30360 (Equivalent)
Cable length Under 3 meters</td></tr>
<tr><td>Signal level</td><td>High level : + 2.4 to + 5.0 V
Low level : - 0.0 to – 0.4 V</td></tr>
<tr><td>Communication settings</td><td>One item or Multi communication can be selected using DSW2-5.
<table>
<tr><th>DIPSW2-5</th><th>Set Range</th></tr>
<tr><td>ON</td><td>Multi-reception</td></tr>
<tr><td>OFF</td><td>One Item</td></tr>
</table></td></tr>
<tr><td>Maximum Reception buffer capacity</td><td>2.95Mbyte
 
</td></tr>
<tr><td>Timing chart</td><td> 

* 1µs < T1, T2
7µs < T3 < 9µs</td></tr>
</table>

5.13 PARALLEL INTERFACE (CONT'D)

Pin Assignments

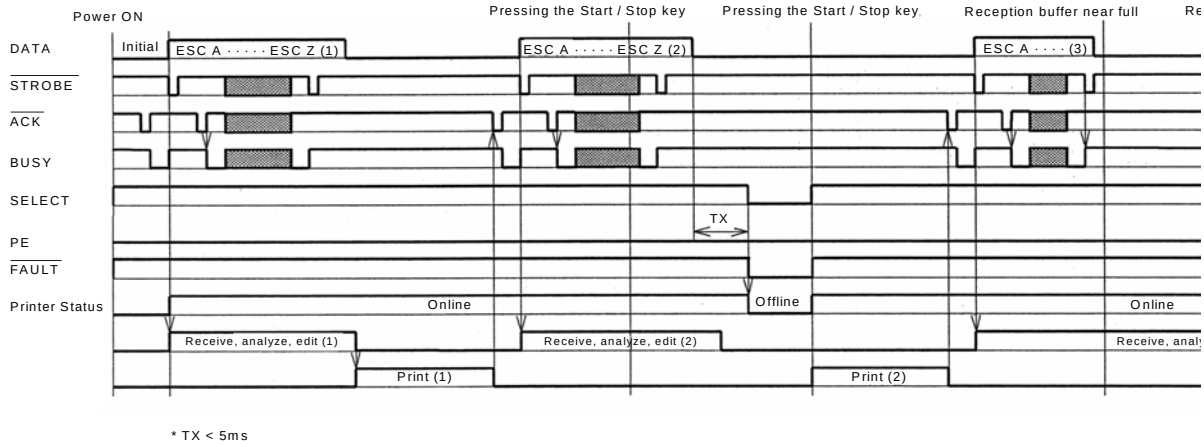
Pin no.	Signal Type	Contents	Pin no.	Signal Type	Contents
1	nSTROBE	Input	19	STROBE-RETURN	SG
2	DATA 1	Input	20	DATA 1- RETURN	SG
3	DATA 2	Input	21	DATA 2 - RETURN	SG
4	DATA 3	Input	22	DATA 3 - RETURN	SG
5	DATA 4	Input	23	DATA 4 - RETURN	SG
6	DATA 5	Input	24	DATA 5 - RETURN	SG
7	DATA 6	Input	25	DATA 6 - RETURN	SG
8	DATA 7	Input	26	DATA 7 - RETURN	SG
9	DATA 8	Input	27	DATA 8 - RETURN	SG
10	nACK	Output	28	ACK - RETURN	SG
11	BUSY	Output	29	BUSY - RETURN	SG
12	PE	Output	30	PE - RETURN	SG
13	SELECT	Output	31		
14			32	nFAULT	Output
15			33		
16			34		
17	FG	Frame Ground	35		
18	24Ω (+5V)		36		

Interface Signals

Pin no.	Signal Type	Direction	Contents
1	nSTROBE	Input	To scan data, make sure that the pulse width of the strobe pulse is set to more than 1 µs. The regular status is "High", however, if it is "Low", the data will be scanned in the first transition.
2 to 9	DATA 1 to DATA 8	Input	DATA1=LSB DATA8=MSB Positive logic code ASCII or JIS7 as well as 8.
10	nACK	Output	A low level pulse signal will be output when data scanning is complete to inform the host.
11	BUSY	Output	"High" will be maintained when the Reception buffer has reached full or when an error occurs in the printer, and "Low" will be output when the printer is ready to receive.
12	PE	Output	The level will become "High" when labels have run out and none have been set.
13	SELECT	Output	The signal will be in "High" level when reception is possible, otherwise it will be "Low" level.
32	nFAULT	Output	The signal will be in "High" level when reception is possible, otherwise it will be "Low" level.

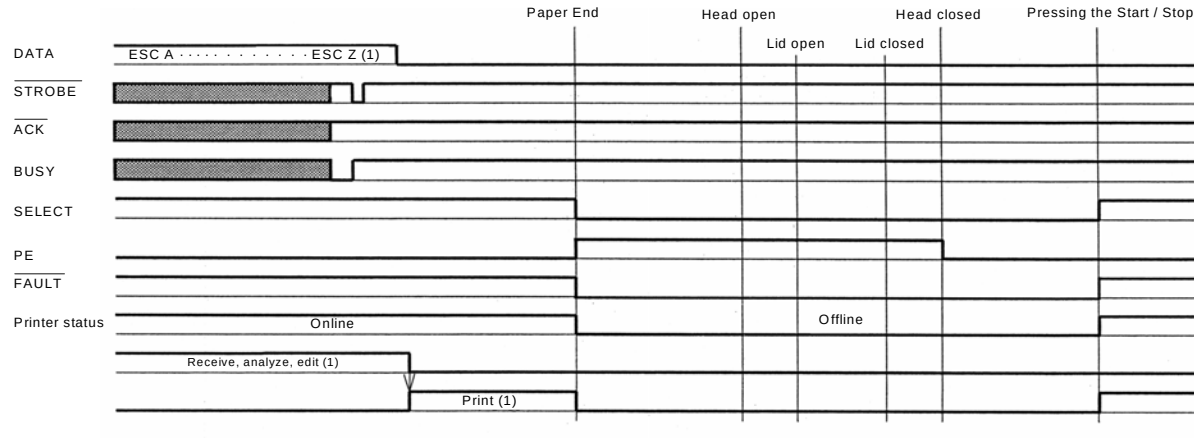
5.14 SINGLE JOB BUFFER

Timing Chart — Normal Processing



* TX < 5ms

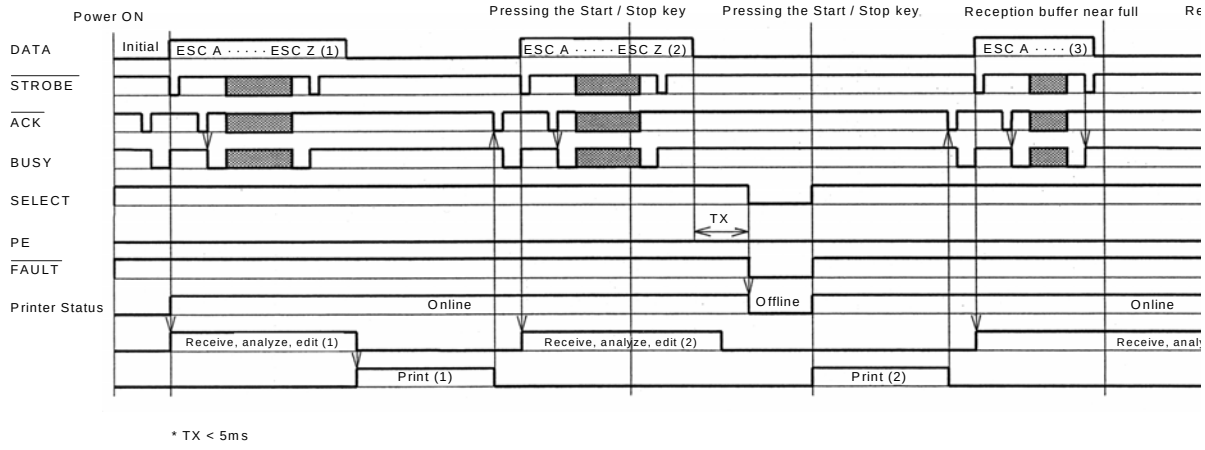
Timing Chart — Procedure during Paper End



Note: Paper End is cleared by closing the Head.

5.14 SINGLE JOB BUFFER (CONT'D)

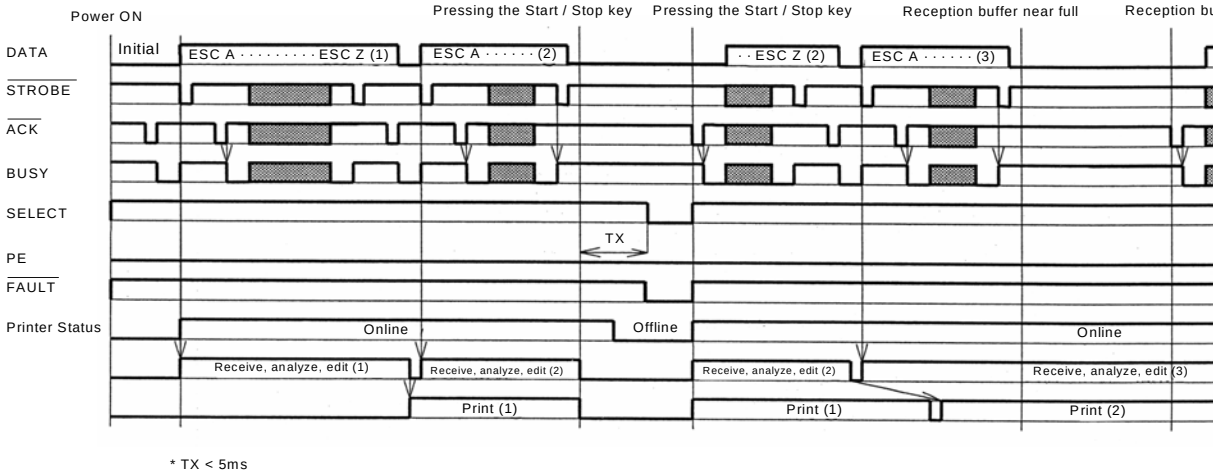
Timing Chart — Error Processing



* TX < 5ms

5.15 MULTI JOB BUFFER

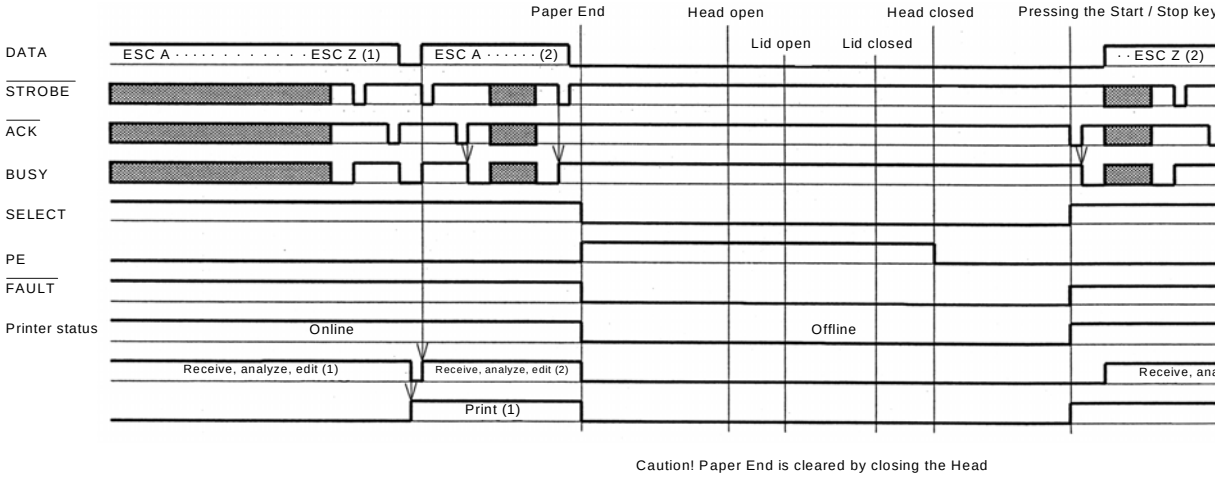
Timing Chart — Normal Processing



* TX < 5ms

5.15 MULTI JOB BUFFER (CONT'D)

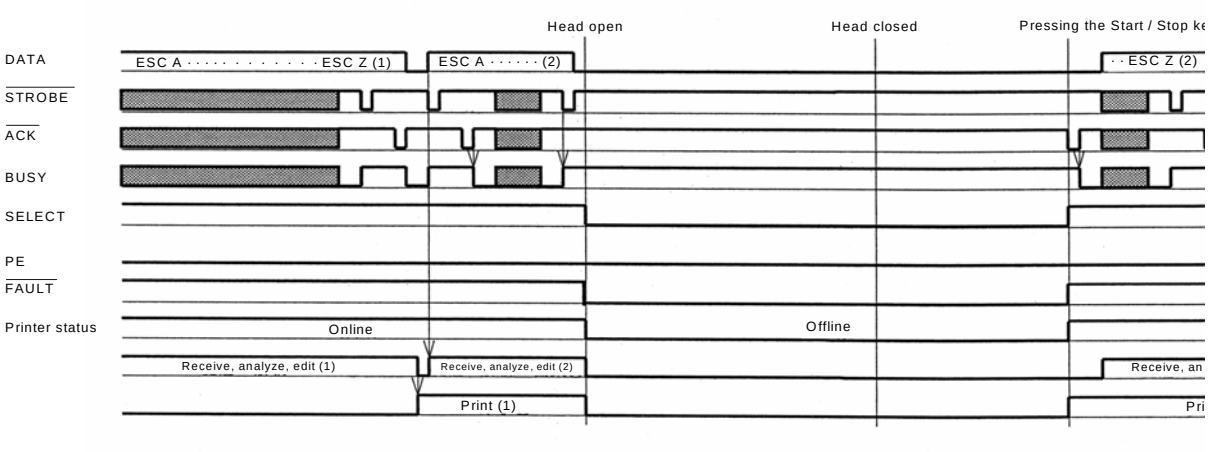
Timing Chart — Procedure during Paper End



Caution! Paper End is cleared by closing the Head

5.15 MULTI JOB BUFFER (CONT'D)

Timing Chart — Error Processing

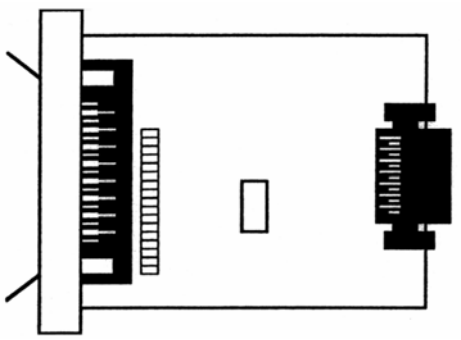
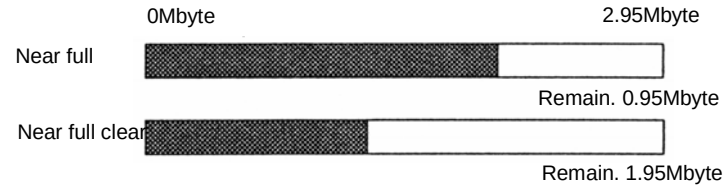
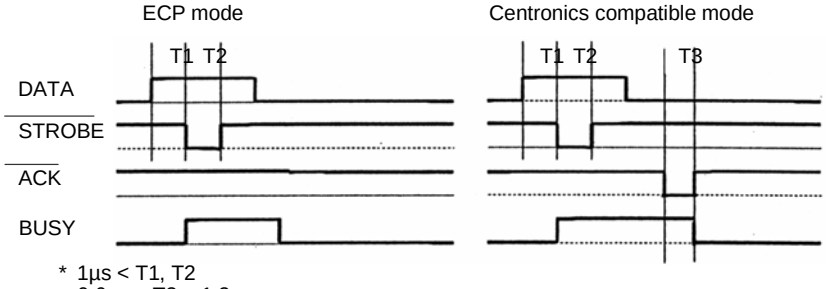


5.16 IEEE 1284 INTERFACE

The IEEE 1284 Interface on the print engine complies with IEEE1284 standards.

The ECP mode is recommended for LPT1 port settings.
Make sure to change the LPT1 port settings through the BIOS settings.

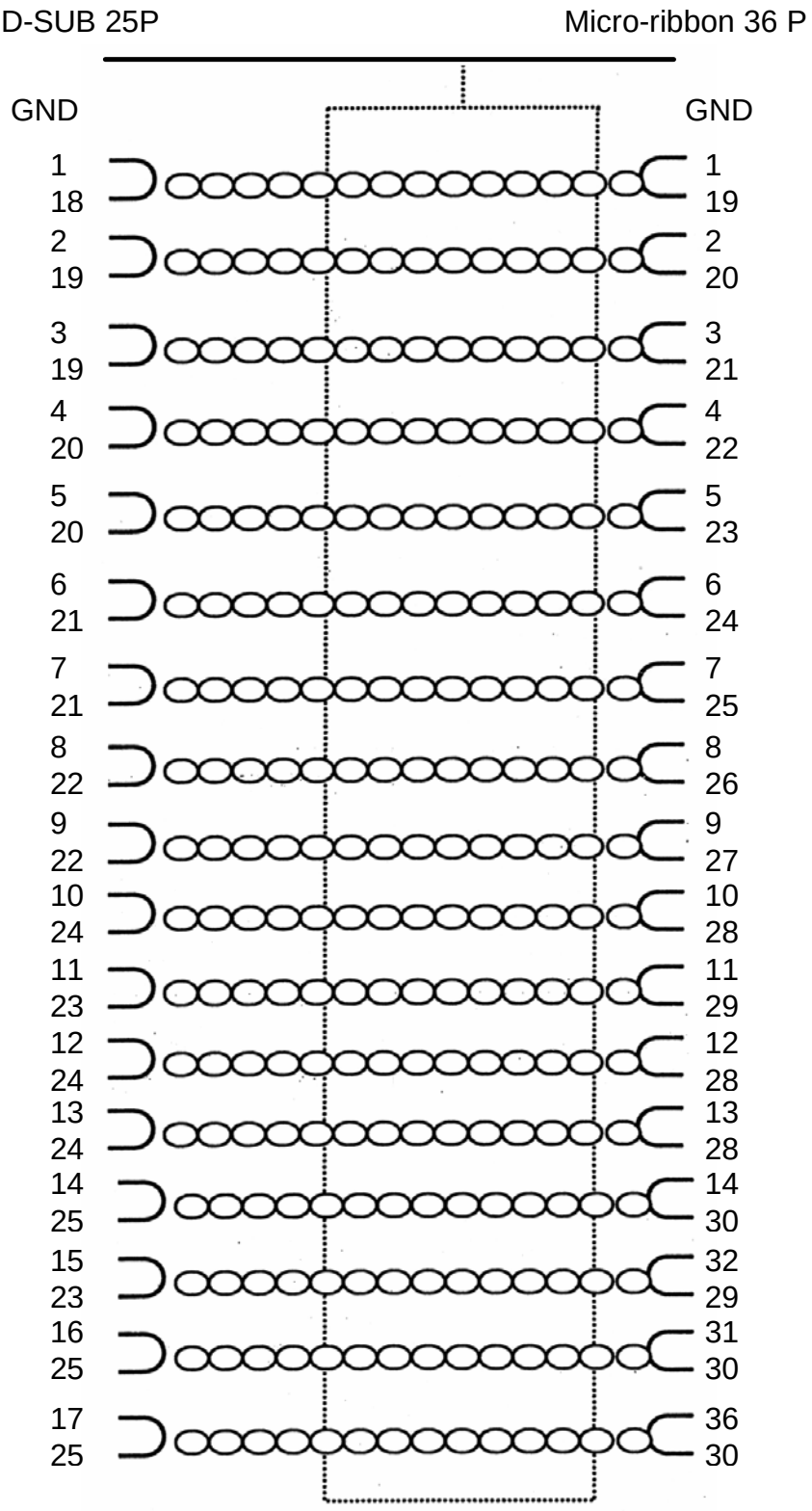
Basic Specifications

<table>
<tr><td>Interface board</td><td>  </td></tr>
<tr><td>Connector</td><td>Printer Amphenol (DDK) 57 to 40360 (Equivalent)
Cable Amphenol (DDK) 57 to 30360 (Equivalent)
Cable length Under 3 meters</td></tr>
<tr><td>Signal level</td><td>High level : + 2.4 to + 5.0 V
Low level : - 0.0 to – 0.4 V</td></tr>
<tr><td>Communication settings</td><td>One item or Multi communication can be selected using DSW2-5.
<table>
<tr><th>DIPSW2-5</th><th>Set Range</th></tr>
<tr><td>ON</td><td>Multi-reception</td></tr>
<tr><td>OFF</td><td>One Item</td></tr>
</table></td></tr>
<tr><td>Maximum Receive buffer capacity</td><td>2.95Mbyte
 
</td></tr>
<tr><td>Timing chart</td><td> 

* 1µs < T1, T2
0.6µs < T3 < 1.2µs
* It is possible to set the ACK width settings (0.5 – 10 µs) in the Advanced mode, in the case of One Item reception.</td></tr>
</table>

5.16 IEEE 1284 INTERFACE (CONT'D)

Pin Assignment
Make sure to use a IEEE1284 compliant cable
.



5.16 IEEE 1284 INTERFACE (CONT'D)

Pin Assignment

With Centronics standards, each signal pin placement is as follows:
However, the IEEE 1284-B type connector is compliant when connecting the IEEE1284 standard.

Pin no.	Signal Type	Content	Pin no.	Signal Type	Content
1	HOST CLK	Input	19	SIGNAL GROUND	
2	DATA 1	Input	20	SIGNAL GROUND	
3	DATA 2	Input	21	SIGNAL GROUND	
4	DATA 3	Input	22	SIGNAL GROUND	
5	DATA 4	Input	23	SIGNAL GROUND	
6	DATA 5	Input	24	SIGNAL GROUND	
7	DATA 6	Input	25	SIGNAL GROUND	
8	DATA 7	Input	26	SIGNAL GROUND	
9	DATA 8	Input	27	SIGNAL GROUND	
10	PERIPH CLK	Output	28	SIGNAL GROUND	
11	PERIPH ACK	Output	29	SIGNAL GROUND	
12	nACK REVERSE	Output	30	SIGNAL GROUND	
13	XFLAG	Output	31	NREVERSE REQUEST	Input
14	HOST ACK	Input	32	nPERIPH REQUEST	Output
15			33		
16	LOGIC GND		34		
17	CHASSIS GND		35		
18	PERIPHERAL LOGIC HIGH	Input	36	1284ACTIVE	Input

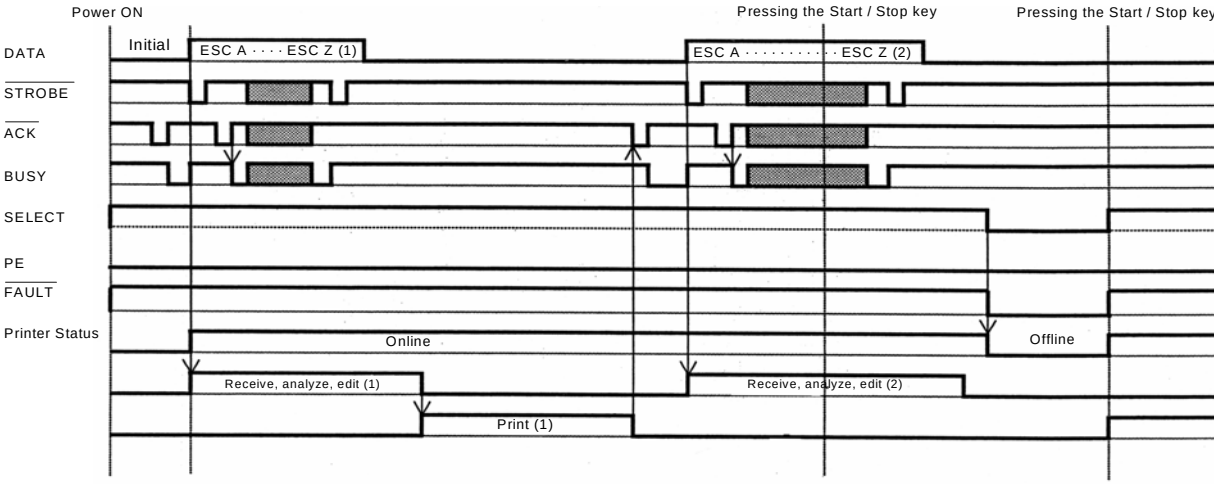
5.17 INTERFACE SIGNALS

With Centronics standards, the content of each signal type is as follows. However, each signal line used with IEEE1284 standards is compliant with IEEE1284 standards.

Pin no.	Signal Type	Direction	Contents
1	HOST CLK	Input	A low active pulse is necessary in synchronized signals for scanning Data 1 to Data 8.
2 to 9	DATA 1 to DATA 8	Input	When entering 8 bit parallel Data, Data 1 is the LSB (least significant bit) and Data 8 is the MSB (most significant bit)
10	PERIPH CLK	Output	This is the LOW active pulse signal that indicates the completion of received data scanning.
11	PERIPH ACK	Output	HIGH active signal which indicates that the printer cannot receive data.
12	nACK REVERSE	Output	HIGH active signal which indicates that the media has run out.
13	XFLAG	Output	HIGH active signal which indicates that data can be received.
14	HOST ACK	Input	Signal for when using the IEEE1284 standard.
17	CHASSIS GND		Connects to the Frame Ground
18	PERIPHERAL LOGIC HIGH	Output	The +5V voltage on the printer side.
19 to 30	SIGNAL GROUND		Connects to the ground for each signal
31	nREVERSE REQUEST	Input	LOW active signal that requests printer initialization.
32	nPERIPH REQUEST	Output	LOW active pulse signal that indicates a printer error.
36	1284ACTIVE	Input	Signal for when using the IEEE1284 standard.

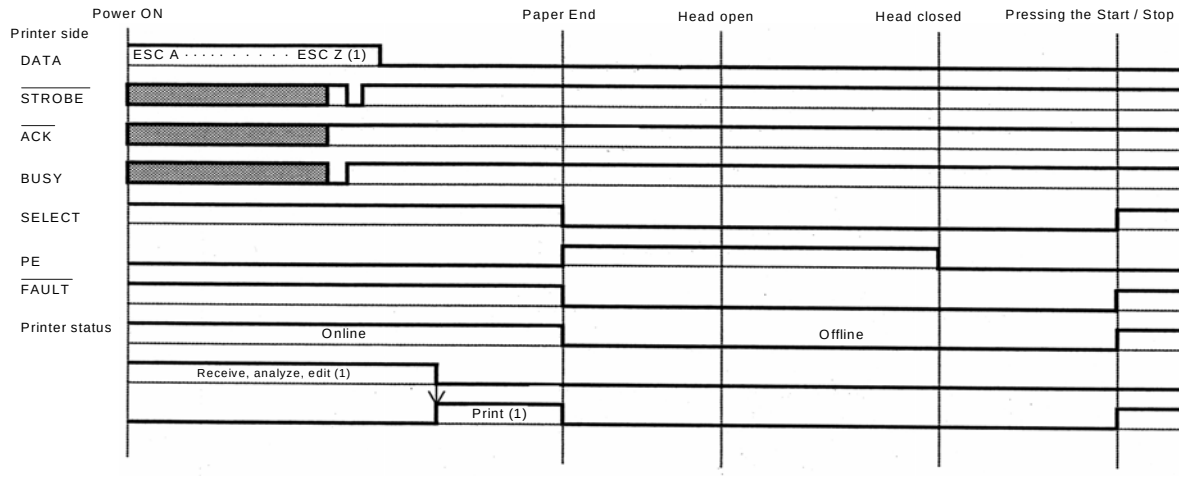
5.18 SINGLE JOB BUFFER

Timing Chart — Normal Processing



5.18 SINGLE JOB BUFFER (CONT'D)

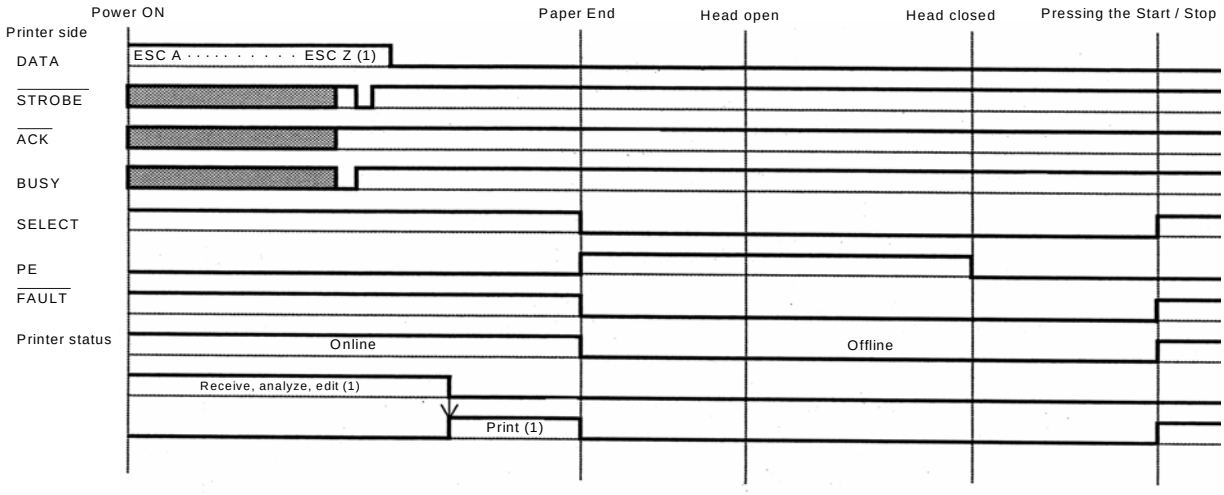
Timing Chart — Procedure during Paper End



Note: Paper End is cleared by closing the Head.

5.19 MULTI JOB BUFFER

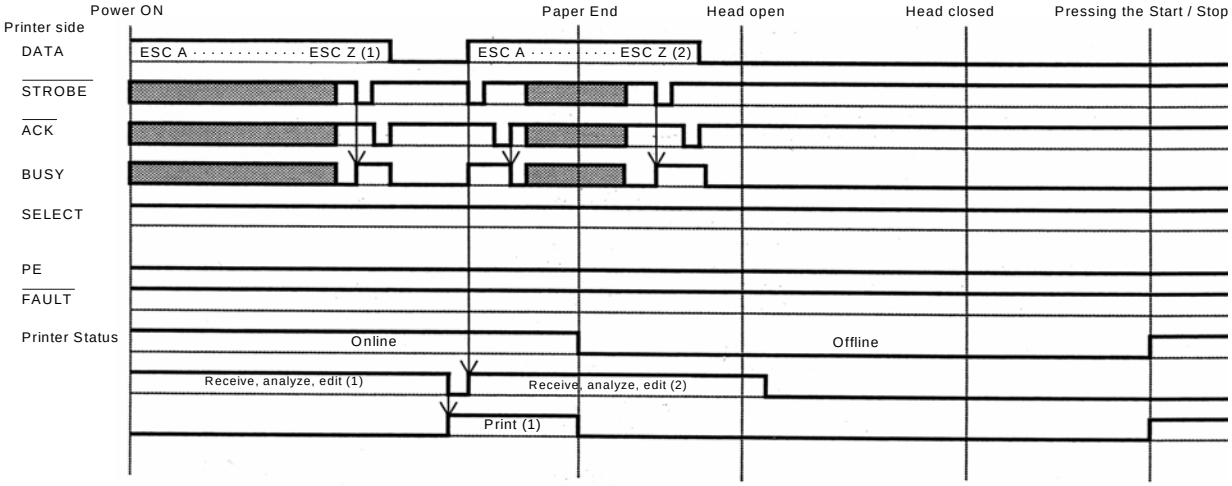
Timing Chart — Normal Process



Note: Paper End is cleared by closing the Head.

5.19 MULTI JOB BUFFER (CONT'D)

Timing Chart — Procedure during Paper End



Note: Paper End is cleared by closing the Head

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6

TROUBLESHOOTING

Observations

If you are unable to produce printouts on the S8400 Series print engine, use this section to make sure the basics have been checked, before deciding you are unable to proceed any further. The section is divided into seven parts:

- Initial Checklist
- Checklist for the Centronics Parallel Interface
- Checklist for the RS232C Serial Interface
- Understanding ON LINE, RIBBON, LABEL indicators
- Understanding the LCD error messages
- Understanding the LCD warning messages
- General Troubleshooting Guide

6.1 INITIAL CHECKLIST

1. Is the print engine powered up and ON LINE?
2. Is the ERROR light on the front panel OFF? If this light is ON, it may mean the print head assembly is open or another error condition is present.
3. Are the Label Hold-Down and Print Head Assembly in the latched position?

6.2 USING THE CENTRONICS (PARALLEL) INTERFACE

1. Is the IBM parallel printer cable connected securely to your parallel port (DB-25S Female) on the PC and to the parallel port on the print engine?
2. Is there more than one parallel interface port on your PC (LPT1, LPT2, etc.)? If so, make sure you are sending data out the correct port.
3. When you send the print job to the print engine, and it does not respond, do you get an error message on your PC that says “Device Fault” or something similar? This may mean that the computer doesn’t know the print engine is there. Verify that:

   a. Both ends of the cable are securely inserted into their respective connectors.

   b The print engine is ONLINE.

   c. The cable is not defective. There are other things that can cause this error message on your computer, but at this stage, a defective cable may be one of the reasons.

6.2 USING THE CENTRONICS (PARALLEL) INTERFACE (CONT'D)

Observations

4. When you send the print job to the print engine and it does not respond, and there is no error message on the PC:

   A. Check your data stream for some of the basics. Is your job framed as follows?
      <ESC>A—DATA—<ESC>Z

   B. Verify that you've included all required parameters in the data stream.

   C. Verify the following:
      - You have not typed a "0" (zero) for an "O" (letter) or vice-versa.
      - You have not missed any <ESC> characters where they're needed.
      - Make sure all print engine command codes are capital letters.
      - Your protocol codes are set for Standard or Non-Standard and your data stream is consistent with these.

5. If you've checked all of the above and the print engine still isn't printing, you may want to try a Receive Buffer Hex Dump to determine what (if anything) the print engine is receiving from your computer. To print Hex Dumps see page 3-19, Configuration and Operation.
   The parallel port is now listening for incoming data. Send your print job. The print engine will now print (only once) a Hexadecimal (Hex) Dump of everything it received from the host computer. Each 2-digit hexadecimal character represents a character the print engine received. It may be tedious, but now you can analyze and troubleshoot the data stream.

6. While checking the Hex Dump printout, look out for the sequence 0D 0A, which is a combination of Carriage Return and Line Feed characters. The command string should be continuous, and you should not see CR or LF characters between the Start Command (**<ESC>A**) and the Stop Command (**<ESC>Z**).

   If you are using BASIC, it may be adding these characters automatically as the line wraps. Adding a "width" statement to your program can help to suppress these extra 0D 0A characters by expanding the line length up to 255 characters. See the beginning of the Programming Reference, under Command Codes, for details on writing a program in BASIC.
   If you are not programming in BASIC, check to see if you have an equivalent statement in the language you're using, to suppress extra carriage returns and line feeds from your data being sent out to the print engine. The data stream should be one complete line going to the print engine.

6.3 USING THE RS232C (SERIAL) INTERFACE

Observations

1. Is the RS232C Serial cable connected securely to your serial port on the PC (DB- 25S Male) and to the RS232C connector on the print engine?

2. Is the cable defective? At the very least, you should be using a “Null Modem Cable,” which crosses pins in a specific manner. This should enable your print engine to print. But we recommend that you eventually use a cable built to specifications as described in **Section 5: Interface Specifications**

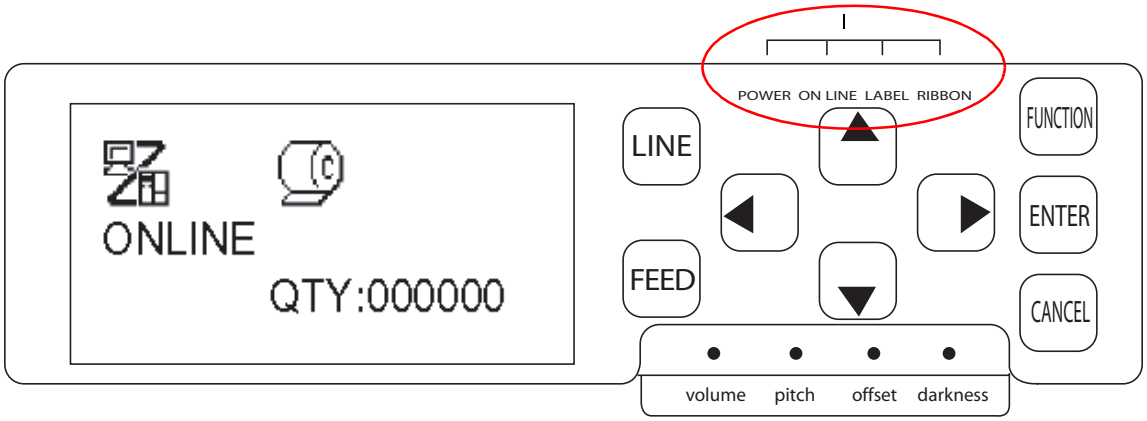
3. Check for obvious errors in the data stream. Remember that all print jobs for serial data must be framed by an **STX** and **ETX**. Again, see the **Section 5: Interface Specifications** if necessary.

4. If after sending your job to the print engine, it only “beeps” indicating a “framing error” message, you may have a configuration problem. There may be some inconsistencies with the Baud Rate, Parity, Data Bits, or Stop Bits in relation to your host computer. If you are confused as to what the print engine’s current RS232 settings are, you may choose the SATO defaults (all DIP switches in the OFF position) to achieve 9600 baud, no parity, 8 data bits, and 1 stop bit.

6.4 UNDERSTANDING THE LED INDICATORS

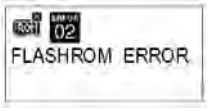
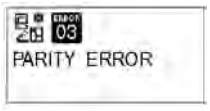
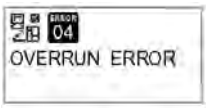
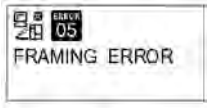
The LED indicators light up or flash to indicate the current status of the print engine. Another indicator is the built-in buzzer which sounds audible beeps to alert the user.

Indicator	Activity	Cause	Remedy
			LED Indicators
RIBBON	**Flashes (red)**	**The ribbon reel is running low on ribbon.**	**You can continue using the printer.**
	Steadily Lit	**The ribbon supply has run out**	**Replace the ribbon if the Ribbon End error message appears during printing.**
LABEL	**Flashes (red)**	**The label reel is running low on label.**	**You can continue using the printer.**
	Steadily Lit	**The label supply has run out**	**Replace the label reel if the Label End error message appears during printing.**
BUZZER	**Beeps**	**There is an error in an incoming printer command or print area specification setting.**	**Correct the printer command or print area settings.**

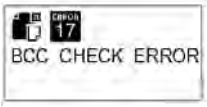
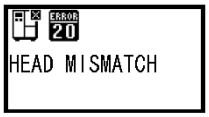


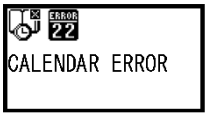
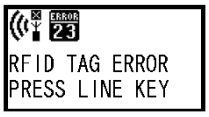
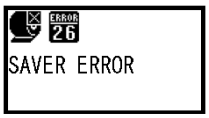
For information on error messages and icons, proceed to the next section.

6.5 UNDERSTANDING THE LCD ERROR MESSAGES

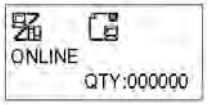
Error No.	LCD Message	Description
01		**Machine Error** **Cause:** Circuit board problem **Remedy:** Replace the PCB or contact a SATO service center **Alarm sound:** One long beep **External signal:** Machine error
02		**Machine Error Temperature Rise** **Cause:** Excessive heat buildup inside the printer **Remedy:** Improve printer cooling and review usage environment **Alarm sound:** One long beep **External signal:** Machine error
03		**Flash ROM Error** **Cause(s):** 1. Flash ROM cannot be accessed 2. Illegal firmware operation requested by software **Remedy:** Replace the PCB or contact a SATO service center **Alarm sound:** One long beep **External signal:** Machine error
04		**Parity Error** **Cause(s):** 1. RS-232C communication settings fail parity checking 2. Error in cable connection **Remedy:** Check and correct communication cables and settings **Alarm sound:** Three short beeps **External signal:** Machine error
05		**Overrun Error** **Cause(s):** 1. RS-232C communication settings exceed legal values 2. Error in cable connection **Remedy:** Check and correct communication cables and settings **Alarm sound:** Three short beeps **External signal:** Machine error
06		**Framing Error** **Cause(s):** 1. RS-232C communication settings are not in the correct frame size 2. Cable connection trouble. **Remedy:** Check and correct communication cables and settings **Alarm sound:** Three short beeps **External signal:** Machine error

Error No.	LCD Message	Description
07		**Buffer Overflow error** **Cause(s):** 1. Size of received data exceeds size of receiving buffer 2. Mismatch in sending/receiving communication protocols **Remedy:** Modify the system to establish the correct communication protocol so as not to exceed buffer capacity **Alarm sound:** Three short beeps **External signal:** Machine error
08		**Head Open error** **Cause(s):** 1. The head unit is not properly locked in place 2. The micro switch that detects the head lock status is malfunctioning **Remedy:** Lock the head unit properly. Check the micro switch. If the error persists, contact a SATO service center **Alarm sound:** Three short beeps **External signal:** Machine error
09		**Paper End error** **Cause(s):** 1. The media supply has run out 2. The media is not set correctly **Remedy:** Set the media correctly **Alarm sound:** Three short beeps **External signal:** Paper end
10		**Ribbon End error** **Cause(s):** 1. The ribbon supply has run out 2. The ribbon has been damaged **Remedy:** 1. Set the ribbon correctly 2. Clean the ribbon path **Alarm sound:** Three short beeps **External signal:** Ribbon end
11		**Sensor error** **Cause(s):** 1. The sensitivity level of the pitch sensor is incorrect 2. The sensor type selection is incorrect for the media used 3. The paper flow is erratic **Remedy:** 1. Re-adjust the sensitivity level of pitch sensor 2. Choose the correct sensor type to match the media being used 3. Clean the paper path to establish a smooth paper flow. If the same error message is still displayed, contact a sales outlet, dealer, or service center **Alarm sound:** Three short beeps **External signal:** Machine error

Error No.	LCD Message	Description
12		**Head related error** **Cause:** There is a problem with the print head **Remedy:** Clean the head and recheck. If the same error message is still displayed, replace the head or contact a SATO service center **Alarm sound:** One long beep **External signal:** Machine error
13		**Memory R/W error** **Cause:** No CF card present, unformatted CF card present, or no free space left, or write failure **Remedy:** Ensure a working CF card is present and formatted. **Alarm sound:** One long beep **External signal:** Machine error
14		**Memory Full error** **Cause:** No download area present, or CF card is full. **Remedy:** Ensure a working CF card is present and formatted. **Alarm sound:** One long beep **External signal:** Machine error
15		**Download Data error** **Cause(s):** Received invalid download, or there is no download area **Remedy:** Check the download data and download data size **Alarm sound:** One long beep **External signal:** Machine error
16		**BCC Check error** **Cause:** BCC attached to sending data (for an item) is different **Remedy:** Check the settings controlling data communication **Alarm sound:** Three short beeps **External signal:** Machine error
17		**Item Number error** **Cause:** The sequence number of print data (for an item) does not match the sequence number of the previously printed data **Remedy:** Check the settings controlling data communication **Alarm sound:** Three short beeps **External signal:** Machine error
18		**Head Mismatch error** **Cause:** Print head is not installed, or it is incompatible with the printer. **Remedy:** Install a compatible print head in the printer. **Alarm sound:** Three short beeps **External signal:** Machine error

Error No.	LCD Message	Description
19		**Kanji ROM error** **Cause:** Problem with the Kanji ROM or ROM data **Remedy:** Check the Kanji ROM installation or replace the PCB **Alarm sound:** Three short beeps **External signal:** Machine error
20		**Calendar error** **Cause:** Problem with the Calendar ROM or ROM data **Remedy:** Check the Calendar ROM installation or replace the PCB **Alarm sound:** One long beep **External signal:** Machine error
21a		**RFID Tag error** **Cause:** Failure writing to an RFID tag **Remedy:** Write to another RFID tag **Alarm sound:** Three short beeps **External signal:** Machine error
21b		**RFID Tag error** **Cause:** Failure writing to an RFID tag **Remedy:** Write to another RFID tag after pressing the LINE button **Alarm sound:** Three short beeps **External signal:** Machine error
21c		**RFID Tag Protection error** **Cause:** Failure writing due to a protected RFID tag **Remedy:** Write to a non protected RFID tag **Alarm sound:** Three short beeps **External signal:** Machine error
22		**Cover Open error** **Cause:** Printer cover is not locked properly, or micro switch for cover open detection is faulty **Remedy:** Lock the cover properly. Check the micro switch **Alarm sound:** Three short beeps **External signal:** Machine error
23		**Saver error** **Cause:** Head stop position is off the specified position. **Remedy:** Press the FEED button to release the error **Alarm sound:** Three short beeps **External signal:** Machine error

6.6 LCD WARNING MESSAGES

Error No.	LCD Message	Description	
01		**Warning: Label Near End**	
		Cause:	**The label supply roll is almost running out**
		Remedy:	**Be ready to replenish the label roll**
		Alarm sound:	**One long beep**
		External signal:	**No output**
02		**Warning: Ribbon Near End**	
		Cause:	**The amount of ribbon remaining in the print engine is low**
		Remedy:	**Be ready to replenish the ribbon**
		Alarm sound:	**One long beep**
		External signal:	**Ribbon near end**
03		**Warning: Receive Buffer Near Full**	
		Cause:	**The free space in the buffer memory is running low**
		Remedy:	**Regulate the sending of data to the print engine until received data has been processed.**
		Alarm sound:	**Three short beeps**
		External signal:	**No output**
04		**Warning: Command Error**	
		Cause:	**A command error has been detected**
		Remedy:	**Review the print data**
		Alarm sound:	**Three short beeps**
		External signal:	**No output**
05		**Warning: Head Check Error**	
		Cause:	**The normal head check function detected an error in the print head, but by setting the head check function to Barcode instead of Normal check mode, printing was able to resume, as the error does not affect the quality of barcodes being printing**
		Remedy:	**Although the print head can still be used for now, immediate attention should be given to correct the head error or replace the print head before the situation worsens**
		Alarm sound:	**Three short beeps**
		External signal:	**No output**
06		**Overheat Error**	
		Cause:	**Printer's internal temperature exceeds 85 degrees C.**
		Remedy:	**Review the usage environment and install cooling measures if necessary**
		Alarm sound:	**Three short beeps**
		External signal:	**No output**

6.7 TROUBLESHOOTING GUIDE

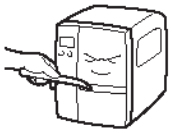
Symptom: The display remains blank when the power switch is pressed.

No.	What to check	Remedy
1	Has the power cable been inserted into the power outlet securely?	Insert the power cable securely into the outlet.
2	Is the power cable damaged?	Inspect the power cable for signs of damage. If possible, try using another printer power cable. Purchase a new power cable specifically designed for this print engine, from the sales outlet or dealer where you bought the print engine from. Never use any other power cable but the power cable specifically designed for this print engine.
3	Is electricity coming to the power outlet feeding the print engine?	Connect another electrical appliance to the power outlet to check for power. If there is a problem with the main power, check if electricity is coming to the building. Also check if power failure has occurred.
4	Has the power fuse of the building blown, or has the circuit breaker been tripped?	Replace the power fuse and reset the circuit breaker.

⚠ Caution

Do not operate the power switch or handle the power cable with a wet hand. You may suffer electric shocks as a result.

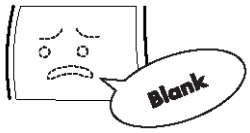
Symptom: Paper is fed but not printed

No.	What to check	Remedy
1	Is the print engine head dirty, or is there any label stuck to the print head?	If the print head is dirty, wipe off the dirt with the supplied cleaning set. If a label is stuck to the print head, take it away. * Do not use metallic object to remove it (the print head may be damaged). If glue of the label is stuck to the print head, wipe it off with the supplied cleaning set. 
2	Are you using genuine SATO paper and carbon ribbons for the S8400?	Be sure to use genuine paper and carbon ribbon **specifically designed for the print engine.**
3	**Is the pitch (paper) sensor dirty?**	If the pitch sensor is dirty, wipe off the dirt with the supplied cleaning set. **See Section 4: Cleaning and Maintenance.**
4	**Is the carbon ribbon wound correctly?**	If the knob of the ribbon-winding unit is not set to its original position, remove the carbon ribbon already wound, and return the knob to its original position.
5	**Is the data/signal sent from the computer correct?**	Turn on the power switch again. If the message still appears, check the software on the computer or the configuration for connections.

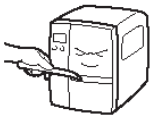
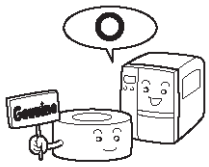
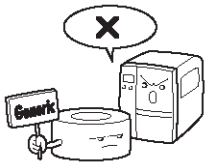
⚠ Caution

Disconnect the power cable before cleaning the print engine.

6.7 TROUBLESHOOTING GUIDE (CONT'D)



Symptom: Low quality print

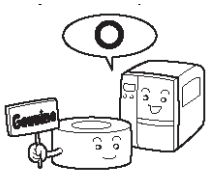
No.	What to check	Remedy
1	**Are the paper and carbon ribbon set correctly?**	Check if the paper and carbon ribbon are securely fixed. Also, lower the head-open lever of the print head unit, and check if the paper and carbon ribbon are in the normal position.
2	**Are the paper and carbon ribbon set correctly?**	Check the paper and carbon ribbon. Set the print density again.
3	**Is the platen roller dirty?**	If the platen roller is dirty, wipe off the dirt with the supplied cleaning set.
4	**Is the print head dirty, or is a label on the head?**	If the print head is dirty, wipe off the dirt with the attached cleaning set. If a label is on the head, take it away.  * Do not use a metallic object to remove it (the print head may be damaged). If glue of the label is stuck to the print head, wipe it off with the supplied cleaning set. See **Section 4: Cleaning and Maintenance**.
5	**Are you using stained paper?**	**Use clean paper.**
6	**Are you using genuine paper and carbon ribbon specifically designed for the print engine?** 	Be sure to use genuine paper and carbon ribbon specifically designed for the print engine. 

Caution

Pull out the power cable before cleaning the print engine.

6.7 TROUBLESHOOTING GUIDE (CONT'D)

Symptom: Print position is misaligned

No.	What to check	Remedy
1	**Are the paper and carbon ribbon set correctly?**	Fix the paper and carbon ribbon securely. Also, release the print head unit, then set the paper and carbon ribbon to the normal position again. Finally, latch the print head back in place.
2	**Is the platen roller dirty?**	If the platen roller is dirty, wipe off the dirt with the supplied cleaning set.
3	**Is the paper/carbon ribbon you are using deformed?**	If the edges of the paper/carbon ribbon are deformed, the paper cannot be fed normally. Use new paper/ carbon ribbon which are not deformed.
4	**Are you using genuine SATO paper and carbon ribbons specifically designed for the print engine?** 	Be sure to use genuine paper and carbon ribbon specifically designed for the print engine. Generic supplies may cost less, but can result in poor printing quality or shortened equipment life, leading to voiding of warranty and/or higher operating costs in the long run.
5	**Is the pitch (paper) sensor dirty?**	If the pitch sensor is dirty, wipe off the dirt with the supplied cleaning set. See **Section 4: Cleaning and Maintenance.**
6	**Is the data/signal sent from the computer correct?**	Turn on the power again. If the error message still appears, check the software on the computer or the configuration of the connections**.**
7	**Are the pitch correction (variable potentiometer) or base point correction (User Mode setting) settings correct?**	Set the pitch correction (variable potentiometer) or base point correction (User Mode setting) again.

⚠ Caution

Pull out the power cable before cleaning the print engine.

7

OPTIONAL ACCESSORIES

7.1 INTRODUCTION

This section contains details of the optional accessories available for the S8400 series:

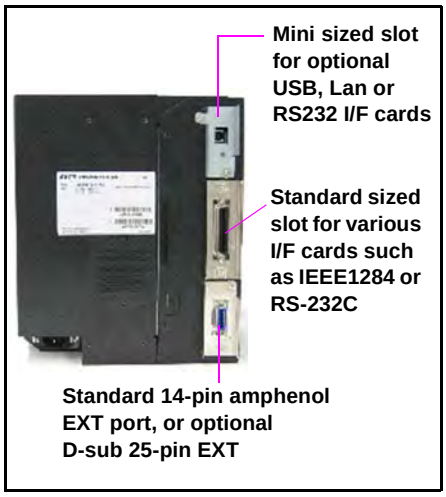
- Interface boards
- Linerless Kit
- Top-mounted I-mark sensor (factory installed only)
- Ribbon Cassette loading option (factory option)
- Ribbon Saver (factory option)
- CompactFlash memory card (factory option)

7.2 AVAILABLE INTERFACE BOARDS

Interface boards enable the printer to exchange data with computers, computer networks and related input/output devices. By installing a different interface board, you can adapt the S8400 series print engine to fit in a wide range of related equipment and usage scenarios.

At the time of purchase, the SR8400 series print engine includes ONE interface board of your choice, from the following interface boards available for the SR8400 series:

- ¤ High Speed RS-232C (25-pin)
- ¤ IEEE1284
- ¤ USB 1.1
- ¤ USB (Exclusive PCI bus)
- ¤ 10BaseT/100Base-TX LAN interface board
- ¤ Wireless LAN IEEE802.11b
- ¤ RFID Kit
- ¤ LVDS Kit for shifting the operational panel to a distant location for remote control of printing operations
- ¤ RS-422/485 for long distance serial communication
- ¤ Centronics
- ¤ External Signal (EXT) port (D-Sub 25-pin) for interfacing with peripherals


Mini sized slot for optional USB, Lan or RS232 I/F cards
Standard sized slot for various I/F cards such as IEEE1284 or RS-232C
Standard 14-pin amphenol EXT port, or optional D-sub 25-pin EXT

For more advanced details on the common interfaces, see **Section 5: Interface Specifications**.

⚠ Caution

Before installing or removing interface boards, be sure to turn off the printer first. Discharge static electricity from your body before touching any of the electronic parts. Failure to observe these precautions can result in severe damage to the components.

7.3 OPTIONAL ACCESSORIES

- **Linerless Option**
  Adds support for printing of linerless labels on the S8400 series print engine.

- **I-mark sensor for top-side I-marks**
  Adds support for detecting I-marks printed on the top side (printable side) of labels. The kit for this optional sensor can be bought separately and installed by a qualified SATO technician.

- **Ribbon Saver (factory installed option)**
  Enables the printer to automatically stop ribbon feeds on empty portions of each label being printed. This option can only be installed during manufacture, and must be ordered at the time of product purchase.

- **Ribbon Cassette loading frame (factory installed option)**
  Enables quick loading of ribbon media by means of a pull-out/push-in cartridge. This option can only be installed at the factory, and should be specified at the time of purchase..

- **CompactFlash Memory Card (factory installed option)**
  Installs additional memory inside the printer for storage of fonts and print formats. The installed CF memory card is sealed and not accessible to the printer operator. Therefore, the CF card option must be specified at the time of product purchase so that it can be pre-installed at the factory before delivery.

For more information on any of the accessories available for the S8400 series print engine, please contact an authorized SATO dealer near you.

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